

IN INDUSTRY • IN TRANSPORTATION • ON THE SEA • IN THE AIR

DIESEL PROGRESS



FIVE DOLLARS PER YEAR

DECEMBER, 1957

FIFTY CENTS PER COPY

65,000 HOURS — WEAR

**City of Greenville
Diesel turns in
impressive 5-year
record lubricated
with TEXACO URSA OIL**



THIS Nordberg 2,400 h.p. Diesel engine was installed in the municipal power plant at Greenville, Texas, in 1946 — and has been lubricated continuously with *Texaco Ursa Oils* in both crankcase and cylinders. G. C. Pullen, Master Mechanic, reports on its condition at the latest inspection . . .

"We took the engine down at about 65,000 hours operation. When we miked the cylinders, the greatest amount of wear found was only .018"

— and that at only two points. Most of the measurements ranged from .008" to .015" — an average of only .0002" wear per 1,000 hours of operation. Furthermore, in No. 1 cylinder the original rings, delivered on the engine in 1946, were found to be in such good condition they were placed right back in service."



Count on *Texaco Ursa Oil* to give your Diesels the

**TUNE IN . . . TEXACO
STAR THEATER
starring MILTON BERLE
on television
every Tuesday night.
METROPOLITAN OPERA
broadcasts every
Saturday afternoon.**



TEXACO

OPERATION NEGLECTIBLE



clean operation that means less wear, less maintenance cost, less fuel consumption. *Texaco Urso Oil* is highly resistant to oxidation... keeps rings free, valve action smooth and snappy. Assures longer life for bearings and all moving parts. In two-cycle engines, ports stay clear.

There is a complete line of Texaco Diesel lubricating oils approved by leading Diesel engine builders and preferred by operators everywhere. In fact —

For over 15 years, more stationary Diesel b.p. in the U. S. has been lubricated with Texaco than with any other brand.

Call in a Texaco Lubrication Engineer for full details. Just contact the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

URSA OILS FOR ALL DIESEL, GAS AND DUAL-FUEL ENGINES

why are **BUDA DIESELS** your best buy in power?

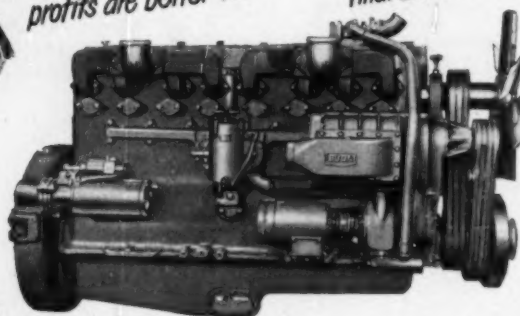
CONTRACTOR:



"Buda Diesels get my jobs done faster. I don't worry about penalty clauses any-more... profits are better too!"

MAINTENANCE SUPERINTENDENT:

"I like their simple design..they're easier to maintain. They don't jerk our equipment to pieces- engines, clutches, transmissions final drives and tires last longer."



JOB SUPERINTENDENT:



OPERATOR:

*"More Torque means less shifting- easier handling
More trips per day"*

*"Buda Diesels keep going. Down-time is at a minimum.
Buda powered units really move dirt"*



POWER FOR PROFIT WITH BIG BUDA DIESELS

Look at it from any angle—big displacement Buda Diesels give you more power and more profit for your money. Buda Diesels' 13 to 25% greater piston displacement . . . 9 to 23% more torque and lugging ability give your payoff equipment the power to move more yardage at lower cost.

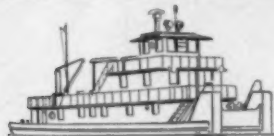
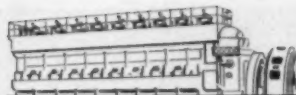
Your Buda Distributor can prove the money-making advantages of Buda dyna-swirl Diesels. Ask him today. Write for Bulletin and data. The Buda Company, Harvey, Illinois.

*a Power-Full and Dependable
Name in Engines...*

BUDA

Manufacturers of Diesel and Gasoline Engines, Maintenance of Way Products, Lifting Jacks, Earth Drills and Material Handling Equipment

BC-17



Gulf Dieselmotive Oil

cuts maintenance costs for industrial, workboat and railroad Diesels



Here's why:

- ▶ Effective detergent action—Keeps rings clean
- ▶ 100% solvent-refined oil
- ▶ Does not form hard metal-like deposits on piston crowns
- ▶ Oxidation inhibited—resists sludging
- ▶ Nonfoaming

Here is the oil that provides protection plus for industrial, workboat, and railway Diesels—Gulf Dieselmotive Oil.

Made from 100% solvent-refined oil, it does not form harmful metal-like deposits on piston crowns, especially important where the same oil is in service for a long period of time.

Gulf Dieselmotive Oil has effective detergent-dispersant action, which helps keep oil-control and compression rings clean and free, and retards sludge formation. As a result, wear and oil consumption are remarkably low.

Containing an excellent oxidation inhibitor, Gulf Dieselmotive Oil has outstanding resistance to oxidation and the formation of crankcase sludge. It's nonfoaming and noncorrosive to silver bearings.

These advantages of Gulf Dieselmotive Oil add

up to cleaner engines, reduced cylinder wear, and lower maintenance costs.

For further information call in a Gulf Lubrication Engineer today. Write, wire, or phone your nearest Gulf office.

Gulf Oil Corporation • Gulf Refining Company,
Gulf Building, Pittsburgh 30, Pennsylvania.





FROM 50 YEARS' EXPERIENCE

ONE FACT STANDS OUT...

*There is no universal
Bearing Material*

Two automotive engines may appear to be alike, yet their operating needs might call for entirely different types of sleeve bearings. For one, tin-base babbitt linings are best; the other, copper-lead alloy. Excavating machines, tractors, pumps, compressors, electric motors, marine engines and Diesels—each has specific bearing needs. These must be met by the ONE best-suited alloy. That's why our six manufacturing plants produce bearings in a great range of alloys and sizes—from an ounce or two in weight to units of hundreds of pounds each.

FEDERAL-MOGUL CORP., 11039 SHOEMAKER, DETROIT 13, MICH.

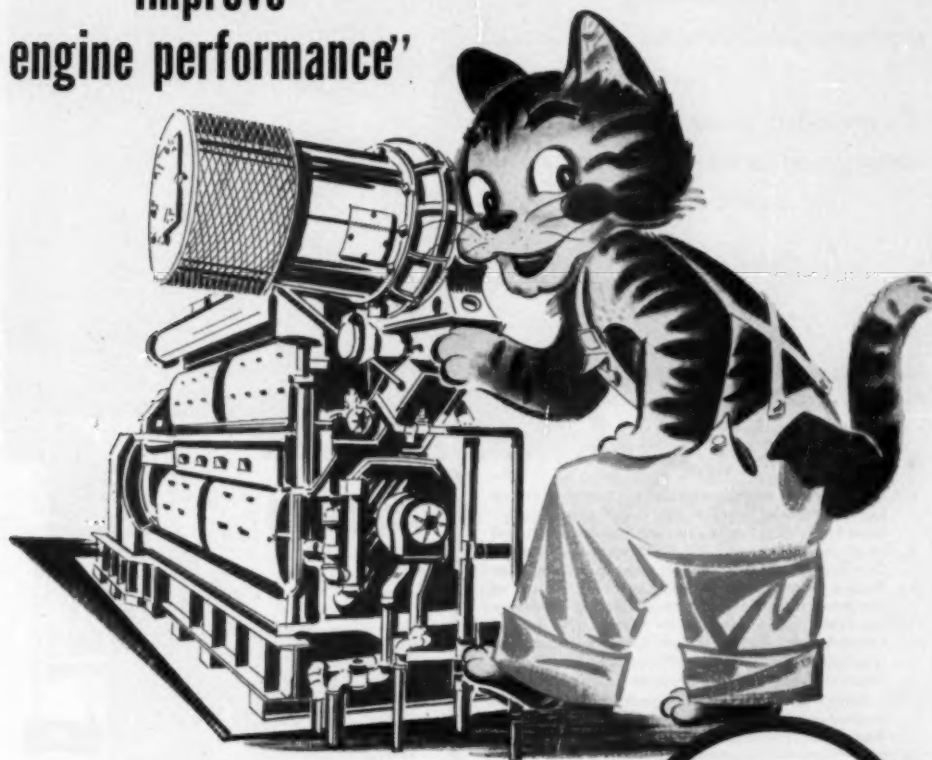


since 1899

Six plants producing sleeve bearings in all designs and sizes; cast bronze bushings;

rolled split-type bushings; washers, spacer tubes, precision bronze parts and bars.

**"Tycol Diesel Oils assure free rings
improve
engine performance"**



Certainly! Tycol Diesel Lubricants resist sludging, gumming and carbonization. They are made from specially refined, high quality bases, and offer outstanding stability. They have high resistance to heat and decomposition. They help diesels operate continuously . . . with maximum efficiency . . . and lowest maintenance costs.

There is a Tycol Diesel Oil scientifically engineered for every Diesel application — from high-speed units for industrial, railway and marine uses where a heavy-duty or detergent oil is necessary to low speed Diesels where a non-additive lubricant can be used.

Want to learn more about these fine oils — engineered to do the job better, at lower cost? Call or write your nearest Tide Water Associated office today.

SEND FOR A FREE COPY OF "TIDE WATER ASSOCIATED LUBRICANIA"



Boston • Charlotte, N. C. • Pittsburgh
Philadelphia • Chicago • Detroit
Tulsa • Cleveland • San Francisco



POWER STATION

**For quiet engine exhausts
and compressor intakes---**

**select
*Burgess-Manning
Snubbers***

● In utilities and manufacturing plants, on Diesel locomotives and boats, in the chemical and petroleum industries... on engines and compressors of all sizes and makes, you will find Burgess-Manning Snubbers effectively quieting the pulsating roar from engine exhausts and the throbbing suction of compressor intakes. Burgess-Manning Snubbers are scientifically designed to smooth the flow of exhaust gases and intake air. Noise is reduced to the desired sound level. Performance of equipment improved. Reduced maintenance.

For a practical solution of your engine and compressor noise problems call Burgess-Manning: sound engineering recommendations; sturdily constructed, reliable products; guaranteed performance.

BURGESS-MANNING COMPANY

749 East Park Avenue, Libertyville, Illinois

YOU CAN DEPEND UPON BURGESS-MANNING
ENGINEERS FOR A QUALITY PRODUCT AND
SOUND ENGINEERING COUNSEL

- A quarter century's experience.
- Engineering and installation know-how gained by work in hundreds of industries.
- Broad line of Snubbers in a wide range of sizes and noise reduction capacities.

Write for Bulletin
"Bring Your Plant Up
To Date With Burgess-
Manning Heavy-Duty
Silent Runner Snubbers."



PIPE LINE STATION

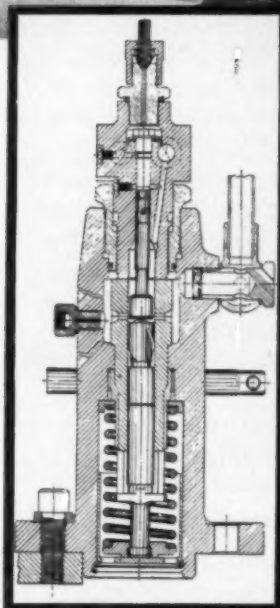
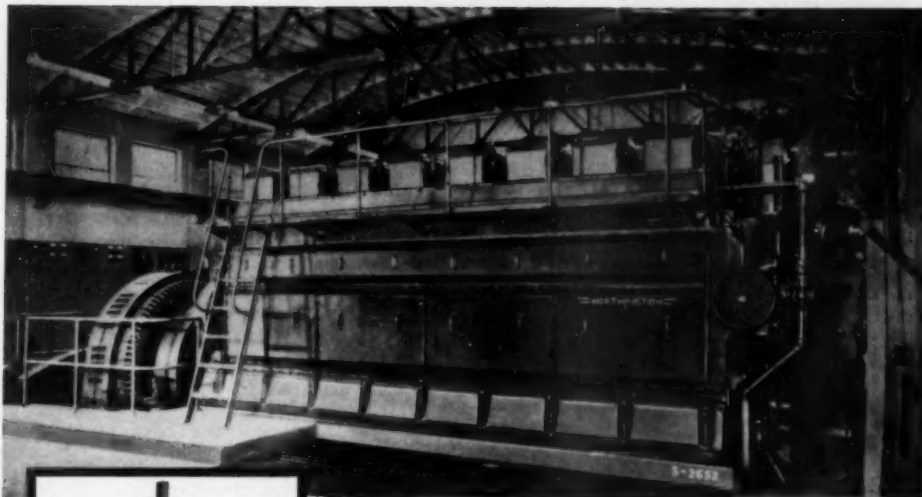


BARGE

ENGINE
TEST HOUSE



DIESEL
LOCOMOTIVE



Cross-section, Worthington patented dual plunger fuel pump.

This Diesel Is Ready FOR A CHANGE IN DIET

Right now this Worthington Diesel—one of three 1760 hp units owned by the city of Tarboro, N. C.—is operating on oil.

But they anticipate natural gas in this area, and this Diesel is ready for it. With slight changes, it can easily be converted.

Worthington's patented dual plunger pumps now completely fuel this engine with oil—producing more perfect atomization, making possible the use of a heavier grade of oil. Also: firing pressures are reduced, exhaust temperatures, too, and combustion is improved.

When the conversion to gas is made, the dual plunger pumps will furnish pilot oil for ignition. Conversion is made quickly and at low cost.

For any engine application, call on Worthington—an engine for any fuel: oil (crude or regular), gas or "dual fuel". Worthington's complete line of engines assures you of the most economical operation no matter what fuel you use.

Only Worthington dual fuel engines offer such exclusives as dual plunger pumps, gas micro-metering valves for each cylinder, and automatic thermal air control—all built to give optimum performance for the fuel used.

Write for Bulletin S-500-B 31 C, Worthington Pump and Machinery Corporation, Engine Division, Buffalo, New York.

WORTHINGTON



ENGINES

E.I.12

ECONOMICAL CONTINUOUS POWER

Diesel Engines, 150 to 2640 hp
Gas Engines, 190 to 2880 hp
Dual Fuel Engines, 345 to 2640 hp

WORTHINGTON-BUILT AUXILIARIES



Engine Starting Compressor



Oil Transfer Pump



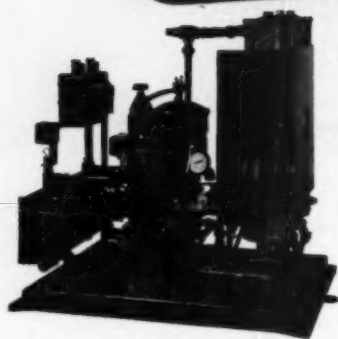
Cooling Water Circulating Pump



Evaporative Type Engine Water Cooler

WHY THE DE LAVAL "PURI-FILTER"

PROVIDES MAXIMUM PROTECTION
FOR YOUR DIESEL ENGINE



Note these Features

- Removes dirt and water by centrifugal force
- Filters out harmful carbon
- Does not remove valuable additives
- Cleans oil at moderate temperature
- Speeds up inspection—crankcase is cleaner
- Minimizes ring sticking
- Increases bearing life
- Saves labor—long runs without bowl cleaning
- Increases oil life
- No dirt...carbon...or water



The De Laval "Puri-Filter" enables the diesel operator to secure the advantages of purifying diesel lubricating oil by centrifugal force and by positive filtration. The centrifuge removes most solid impurities and all water, and the filters complete the cleaning operation and also restore a good measure of color.

The De Laval "Puri-Filter" is a combination of the De Laval "Uni-Matic" Oil Purifier and Fram "Filcron" Filters. The unit is supplied complete with dirty-oil and clean-oil pumps, and is piped ready to operate. Electrical controls are provided, and all parts are compactly mounted on a sturdy metal base.

With the "Puri-Filter," diesel lubricating oil can be maintained truly *clean* and *dry*—the maximum in protection for any engine.

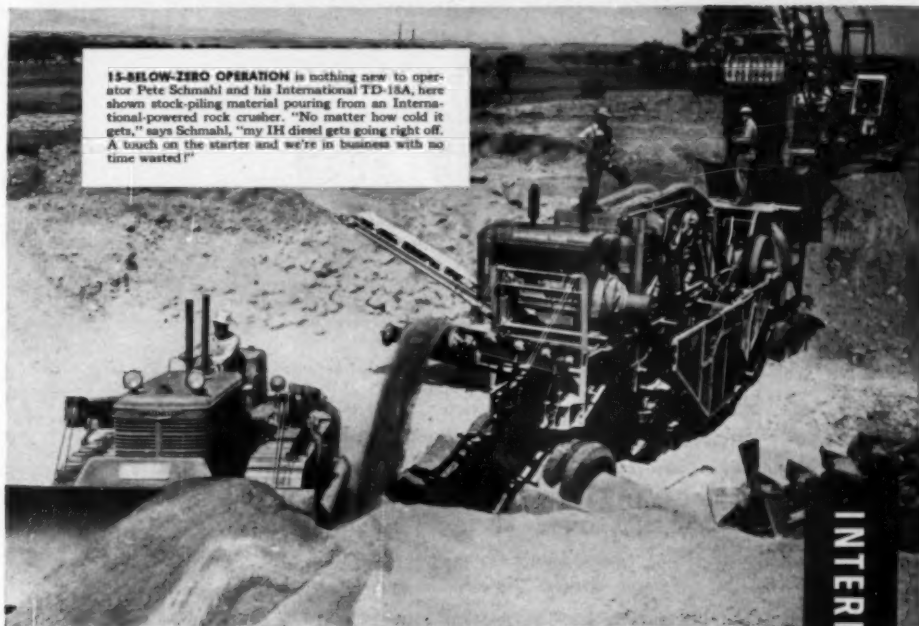
Ask for Bulletin DL-1.

THE DE LAVAL SEPARATOR COMPANY
Poughkeepsie, New York 427 Randolph St., Chicago 6
DE LAVAL PACIFIC CO., 61 Beale St., San Francisco 5
THE DE LAVAL COMPANY, Limited, Peterborough, Ont.

DE LAVAL OIL PURIFIERS

FOR DIESEL LUBRICATING OIL

Rocky Mountain ROCK CRUSHER



12-BELOW-ZERO OPERATION is nothing new to operator Pete Schmahl and his International TD-18A, here shown stock-piling material pouring from an International-powered rock crusher. "No matter how cold it gets," says Schmahl, "my IH diesel gets going right off. A touch on the starter and we're in business with no time wasted!"

Versatile Colorado contractor finds International power pays off on every job

Colorado's Winalow Construction Company handles almost every phase of moving and processing earth and rock. They excavate, build roads, produce crushed stone, clay and sand for their own and other construction jobs.

All along the line, they rely on International crawlers and power units. For example, to supply cushion material for the new Denver-Boulder super-highway, Winalow uses a UD-18A engine to run the rock crusher, and a TD-18A crawler to stock-

pile finished material and push raw rock up to the dragline.

"We've got eighteen Internationals," says Winalow, "because we demand machines that give minimum operating costs and maximum work done per day. Also we get constant attention from our International Industrial Distributor. He figures his job isn't over when he makes a sale. His goal is a satisfied customer. And we're more than satisfied. We're enthusiastic!"

Get the low-down on International machines from your distributor. Put "Power that Pays" to work for you!

International Harvester Company, Chicago 1, Ill.

INTERNATIONAL



POWER
THAT PAYS

**"When they saw the star,
they rejoiced---"**

Matthew 2:10



IS not this, then, a season for rejoicing . . . a season for reviewing and re-appraising the priceless values we have enjoyed in this America? Among others, the eminent right of free enterprise . . . the right to work at or leave any job anywhere at any time. Shall we not agree that so fortunate a people must guard its heritage jealously? This land of ours challenges men against failure in any venture . . . its reward to men who work is a certain security . . . a certain freedom to think and to act together and as individuals for the greatest good to all the people of the world. Shall we look with sincere appreciation upon the gift we have so lately received from the valiant? . . . Shall we pause this Holiday Season to render to God our gratitude and to America our undivided loyalty so that there may be . . .

Peace on Earth to Men of Good Will.



SAFE

FOR YOUR ENGINES AND COMPRESSORS



SAFETY SEAL

THE SAFEST SEALING RING EVER DESIGNED

The Safety Seal Ring is the safest and most efficient ring I have ever designed during 33 years of piston ring experience. It is, an improved single-piece sealing ring designed specifically for today's modern equipment and heavy work loads and made only by Safety Seal Piston Ring Co. (not affiliated with any other piston ring manufacturer). Safety Seal Rings are *service-proved* and guaranteed to perform to your satisfaction.

WM. S. BAKER,
Chief Engineer

All Types of
Plain and Oil Rings

Pressure-Balanced Piston Rings

No other piston ring protects your cylinder liners against scoring and excess wear like the new SAFETY SEAL Ring. It is the safest sealing ring ever designed, because it is the **ONLY** ring that gives you Pressure-Balanced Circularity. This means that correct and uniform ring-to-cylinder wall pressure is maintained at every point around the diameter of the ring.

With Safety Seal Rings your engine or compressor is safe from the excessive and uneven cylinder wear which often occurs with older type sealing rings not designed for pressure balance. In addition, you get all of the other important benefits of an improved single-piece sealing ring... higher compression, increased horsepower, and low fuel and lube oil consumption... which result from a positive, leak-proof piston seal.

If you have heavy load demands on your engines or compressors, the chances are good that you can increase output and cut operating costs with Safety Seal Rings. No cost or obligation for help from our experienced Engineering Department with your piston ring problems. Write today for the name of your nearest Safety Seal representative.

SAFETY SEAL PISTON RING CO.

P. O. Box 106

Phone FORTUNE 2838

Fort Worth 1, Texas

THE ONLY SEALING RING THAT GIVES YOU THE SAFETY OF PRESSURE-BALANCED CIRCULARITY

CYCLAN

The new Piston Ring material for tough service
in heavy duty Diesel and Gas Engines



1 Cyclan IS TOUGH,
WITH PLENTY OF
TENSION, BUT NOT BRITTLE



2 Cyclan HAS TWICE
THE BREAKAGE RE-
SISTANCE OF ORDINARY IRON



3 Cyclan RETAINS
ORIGINAL TENSION
UP TO 700° F.



4 Cyclan WITHSTANDS
IMPACT, HAMMERING,
AND FLEXING



5 Cyclan WITHSTANDS
CONSIDERABLE DISTOR-
TION WITHOUT LOSING SHAPE



6 Cyclan RESISTS
WEAR FAR BETTER
THAN STANDARD RING IRON

AVAILABLE FOR RINGS UP TO 9" DIAMETER.

Write for complete information



SEALED POWER
CORPORATION
MUSKEGON, MICHIGAN

Sealed Power
PISTON RINGS · PISTONS
CYLINDER SLEEVES

Cummins® Diesels do so many jobs—so much better



Shovels, cranes,
industrial locomotives



Drilling rigs, centrifugal
pumps, generator sets



Buses and
on-highway trucks



Earthmovers, logging
yarders and loaders



Off-highway trucks,
crawler tractors



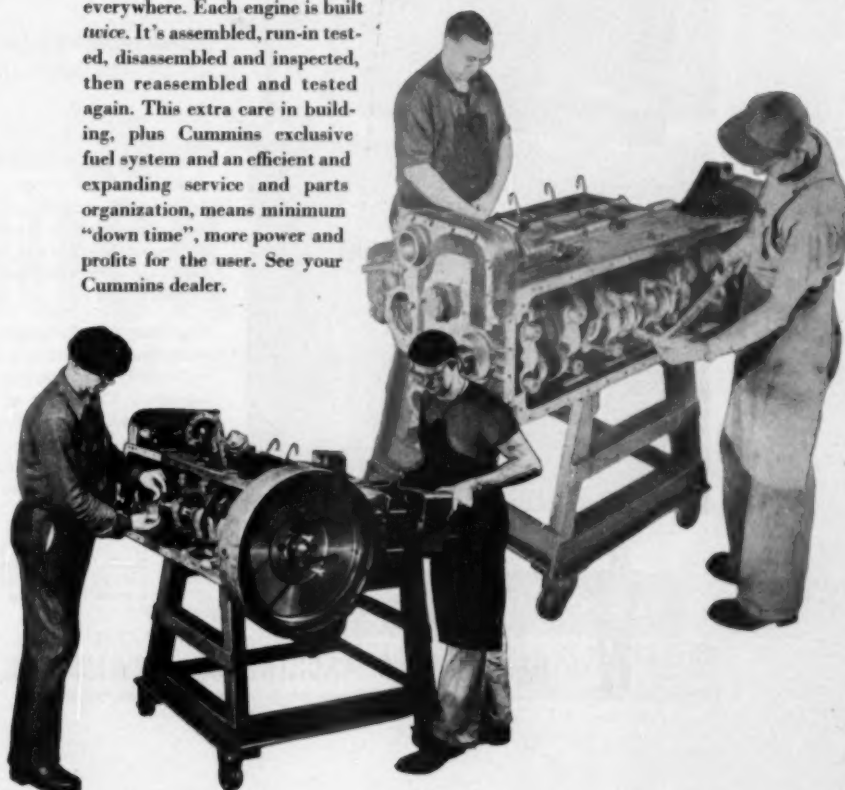
Work boats,
pleasure craft

Lightweight, high-speed Diesels (50-550 hp) for these and many other uses

...because they're

**BUILT
NOT
ONCE
BUT
TWICE**

Rugged, lightweight, high-speed Cummins Diesels are at work everywhere. Each engine is built twice. It's assembled, run-in tested, disassembled and inspected, then reassembled and tested again. This extra care in building, plus Cummins exclusive fuel system and an efficient and expanding service and parts organization, means minimum "down time", more power and profits for the user. See your Cummins dealer.



TRADEMARK REG. U. S. PAT. OFF.

**Diesel power by
CUMMINS**

CUMMINS ENGINE COMPANY, INC., COLUMBUS, INDIANA

Export: Cummins Diesel Export Corporation • Columbus, Indiana, U.S.A. • Cable: Cumdiex

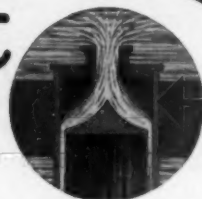
DECEMBER 1951

13

Dirty Water can't "Shut-down..."



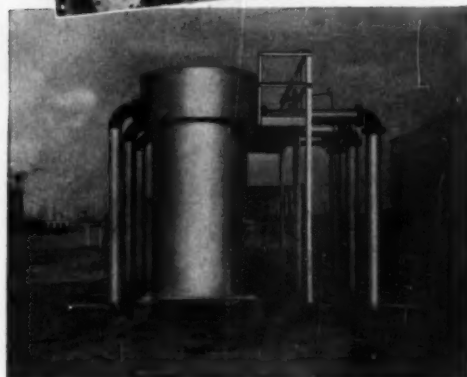
Vogt



film type exchangers

(Condensers—Coolers—Evaporators)

Patent Nos. 1,935,270 - 2,057,597 - 2,424,441



River water, well water or brackish water are all alike to this exchanger *because it can be cleaned while in operation!* The water distributing ferrules need only be removed successively for the cleaning brush or tool whereby the tubes receive additional water which sluices away the dislodged dirt.

Vogt Film Type Exchangers are operating with real economy of first cost, operation and maintenance in power, petroleum, and chemical industries. They serve as Jacket Water Coolers, Feed Water Heaters, Hydrocarbon Evaporators, Sulphuric Acid Coolers, and Sulphur Dioxide Condensers, and can be designed to cool or heat any liquid and to condense or evaporate any fluid.

TOP: Four units at Newton Falls, Ohio Municipal plant cool water for diesel engines and a lubricating oil cooler.

BOTTOM: Jacket Water Coolers serving engines of 7,500 HP in the compression plant of a Western Oil Refinery.



[Bulletin ME-7 describes typical installations of Vogt Film Type exchangers and is available upon request.]

HENRY VOGT MACHINE CO., LOUISVILLE, KY.

Branch Offices: NEW YORK, CHICAGO, CLEVELAND, DALLAS, PHILADELPHIA,
ST. LOUIS, CHARLESTON, W. VA.

P&H

DIESEL ENGINES

2-CYCLE



SHOCK LOADS

EVERY 30 SECONDS

That's normal operation for power shovels—the toughest assignment known for diesel engines. It's the service P&H Diesels were designed to take. Years of superior performance, attested by hundreds of users, prove that P&H Diesels can take *any* of your toughest jobs in stride. It's one reason wise users are standardizing on P&H Diesels. There are many other reasons worth learning. For literature, write Diesel Division, Harnischfeger Corporation, Port Washington, Wisconsin.

P&H

DIESEL DIVISION

HARNISCHFEGER

CRYSTAL LAKE ILL. ILLINOIS, U.S.A.



pick the drive
that's best for your plant



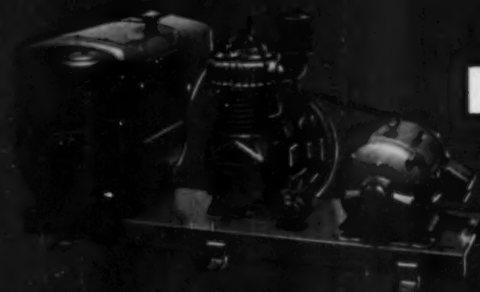
ELECTRIC MOTOR
The most common drive for industrial plants.



DIESEL ENGINE
The most common drive for industrial plants.



Gas Engine
The most common drive for industrial plants.



choose **GARDNER-DENVER**
for reliability

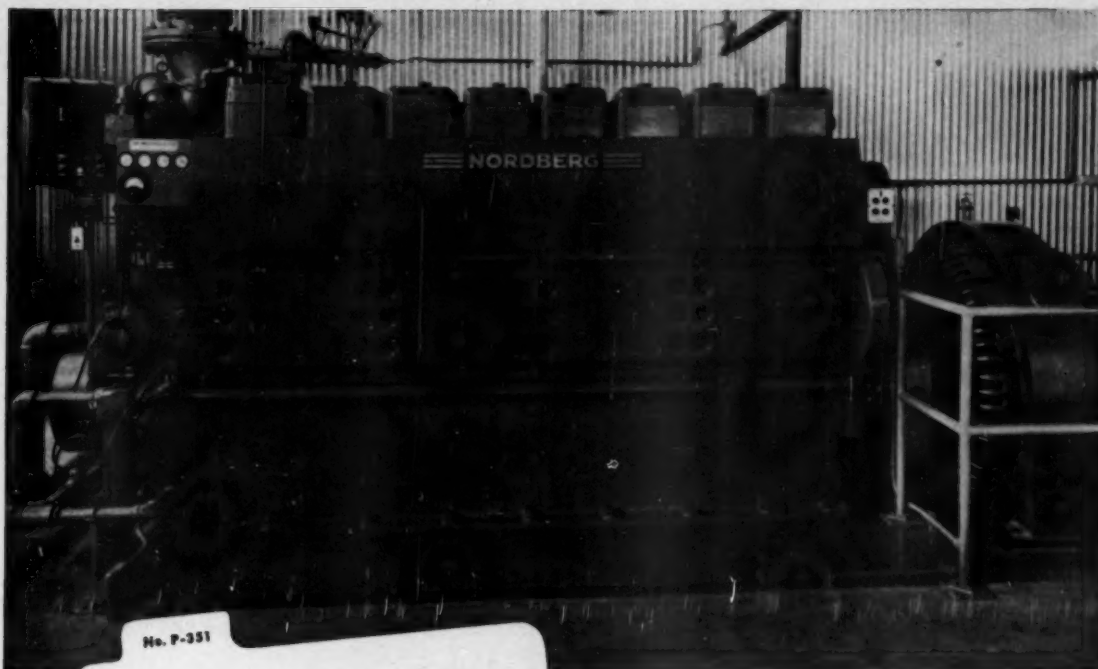
You know how important it is to have
when your plant installation includes a
Gardner-Denver Air-acting Compressor.
It's important for the reason that it's
the only one that's built to last.

Since 1922

Gardner-Denver has been producing air-acting
compressors for the industrial market.
And we've been doing it better and better
every day. That's why our compressors are
the most reliable in the industry.

GARDNER-DENVER

THE QUALITY STANDARD IN AIR-ACTING COMPRESSORS



**THE CASE OF THE
STAND-BY DIESEL
that paid for itself in
FIVE MINUTES**

**NORDBERG DIESELS FOR EVERY
POWER REQUIREMENT . . . 10 TO 9600 H.P.**

For regular or emergency service, you can't beat the advantages of Nordberg Diesels . . . they can be added to the line quickly, and can be held ready for instant service without exorbitant stand-by expense . . . and in the complete line of Nordberg two and four-cycle Diesel engines, including both oil and gas burning types, you will find exactly the right unit to meet your present and future power requirements . . . in sizes up to 9600 hp.

THIS 8-cylinder 720 hp Nordberg Supercharged and Intercooled Diesel is connected to a 500 kw AC generator for emergency power needs at the big Owens-Corning Fiberglas plant at Santa Clara, California.

With the process at this particular plant, an interruption of power for more than 5 minutes' duration could raise havoc with the processing machinery. To guard against any such shutdown caused by a failure of purchased power, the Nordberg Diesel is ready to take over the plant load at once. To make sure full power is instantly available, the engine is constantly maintained at operating temperature. Once each day the engine is started, paralleled with purchased power, and the plant load taken over for a short period . . . assuring its readiness, and familiarizing personnel with rapid operating procedure.

Since this installation was made, eight main power failures have occurred without warning. *In each case, the Nordberg stand-by unit was on the line and supplying emergency power within three minutes.* This service has more than saved the Diesel's original cost.

Here, then, is proved Nordberg Dependability . . . *Ready for instant service!*

NORDBERG MFG. CO.
Milwaukee 7, Wis.

P-331



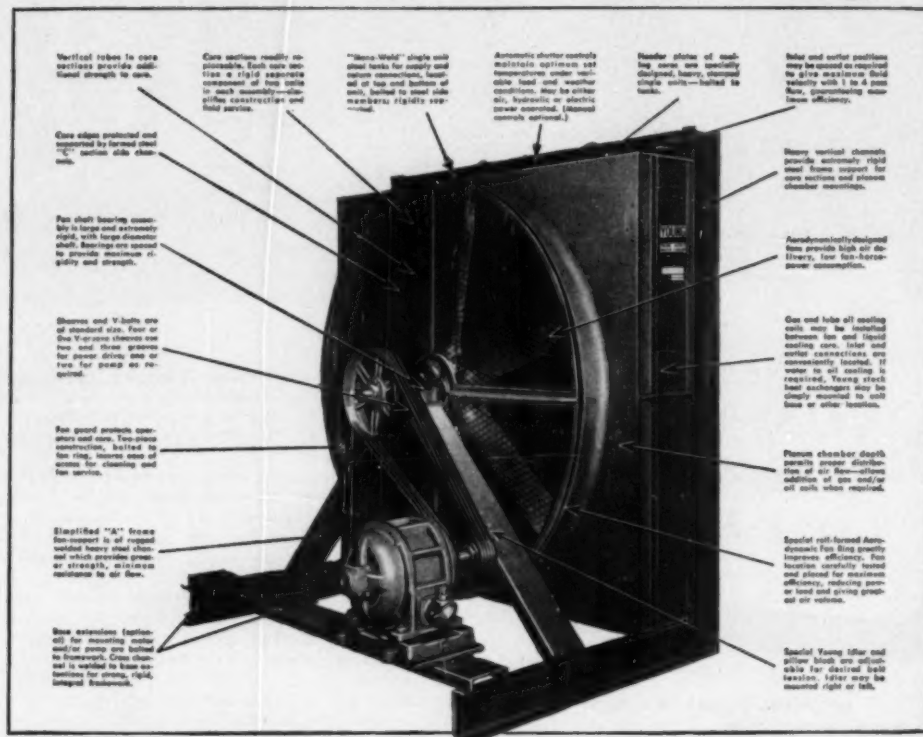
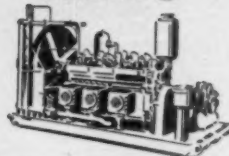
Presenting
the New



YOUNG

Greater cooling capacity...more compact, rugged design for stationary or portable Diesel engine applications

Jacket Water
Coolers



YOUNG

Heat Transfer Products
for Automotive and Industrial Applications.



Heating, Cooling, Air
Conditioning Products
for Home and Industry.

YOUNG RADIATOR COMPANY

Dept. 401-A • EACINE, WISCONSIN

Factories at Racine, Wisconsin, and Motron, Illinois

OIL FIELD DISTRIBUTORS:

TULSA: J. E. Mack Company, 1341 S. Boston St., Rm. 109
LOS ANGELES: Flannery & Everett Inc., 5043 Santa Fe Ave.
MUSKEGON: Harold J. Young, 206 Montgomery Bldg.
Others in Principal Cities

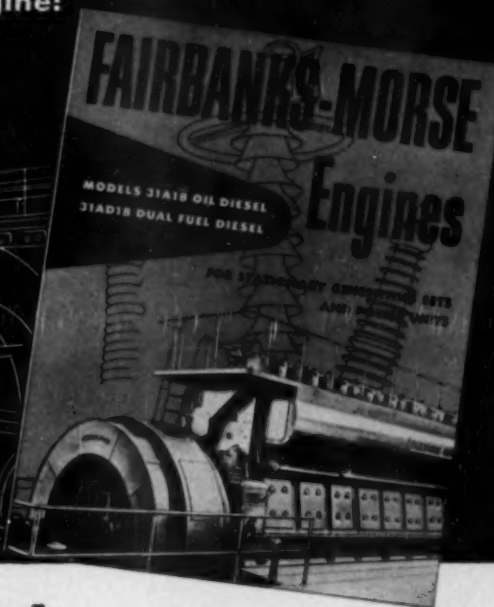
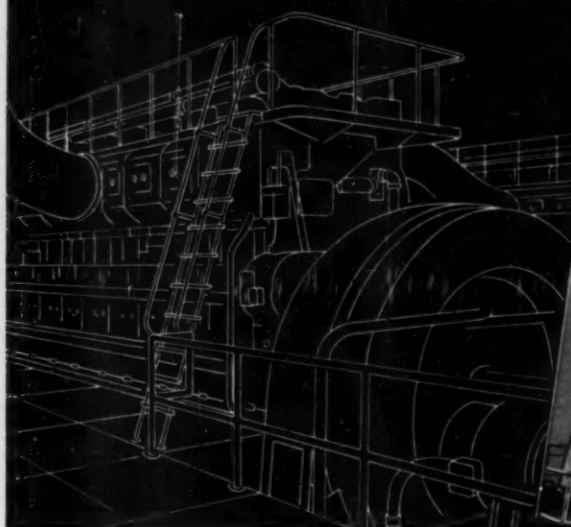
From the many features shown above, you can see that *extra ruggedness* is built into every component of improved Young Jacket Water Coolers. The result is a unit that will last the life of the power plant...one that excels in mobile service—that has the necessary compactness and ample capacity for field duty on portable equipment.

Young designing permits the addition of lube oil and/or gas cooling coils between the water cooling core and the fan, making possible a lower fan-horsepower requirement.

Catalog No. 1351 plus ratings, specifications and other details will be furnished upon request. See your nearest Young Distributor, or write direct.

NEW BULLETIN

Describes Newest **BIG** Fairbanks-Morse
Diesel Dual Fuel Engine!



Send for Your Copy!

Here is complete, up-to-date and authoritative information on the newest Diesel Dual Fuel engines in the 3500 hp. class! A valuable reference, it covers the advanced design features you'll find in the new Fairbanks-Morse Model 31A18 Oil Diesel and Dual Fuel engines. With cross-sections and descriptive diagrams, it covers in detail the design and operation of these heavy duty engines, including complete descriptions of Dual Fuel operations—showing how the Model 31A18 Oil Diesel engine may be economically changed to a Dual Fuel engine by merely installing simple accessory equipment. Power station owners and operators interested in low operating and maintenance cost, automatic safety control, simplicity of design and operation—and complete dependability with high efficiency—should have this book for their files. Use the coupon to get your copy.



FAIRBANKS-MORSE,

a name worth remembering

DIESEL AND DUAL FUEL ENGINES • DIESEL LOCOMOTIVES • ELECTRICAL
MACHINERY • PUMPS • SCALES • RAIL CARS • MAGNETOS • FARM MACHINERY

TO LEARN MORE ABOUT THESE MODEL 31A18 FEATURES...

In bloc construction... for greater rigidity and correct alignment...

Removable cylinder liners... with integrally cast leakproof waterjackets...

Dome-shaped cylinder heads... for improved combustion and cooling...

Improved connecting rod design... pistons and rods may be removed without disturbing crankpin bearings...

Oil-cooled pistons... for longer piston ring and liner life...

Simple controls... start or stop by the movement of a single lever. Hydraulic governor speed control...

Use this Coupon!

Fairbanks, Morse & Co.,
600 South Michigan Ave.,
Chicago 5, Illinois

Send me a copy of the new bulletin on the Model 31A18 Oil Diesel and Dual Fuel engine.

Name

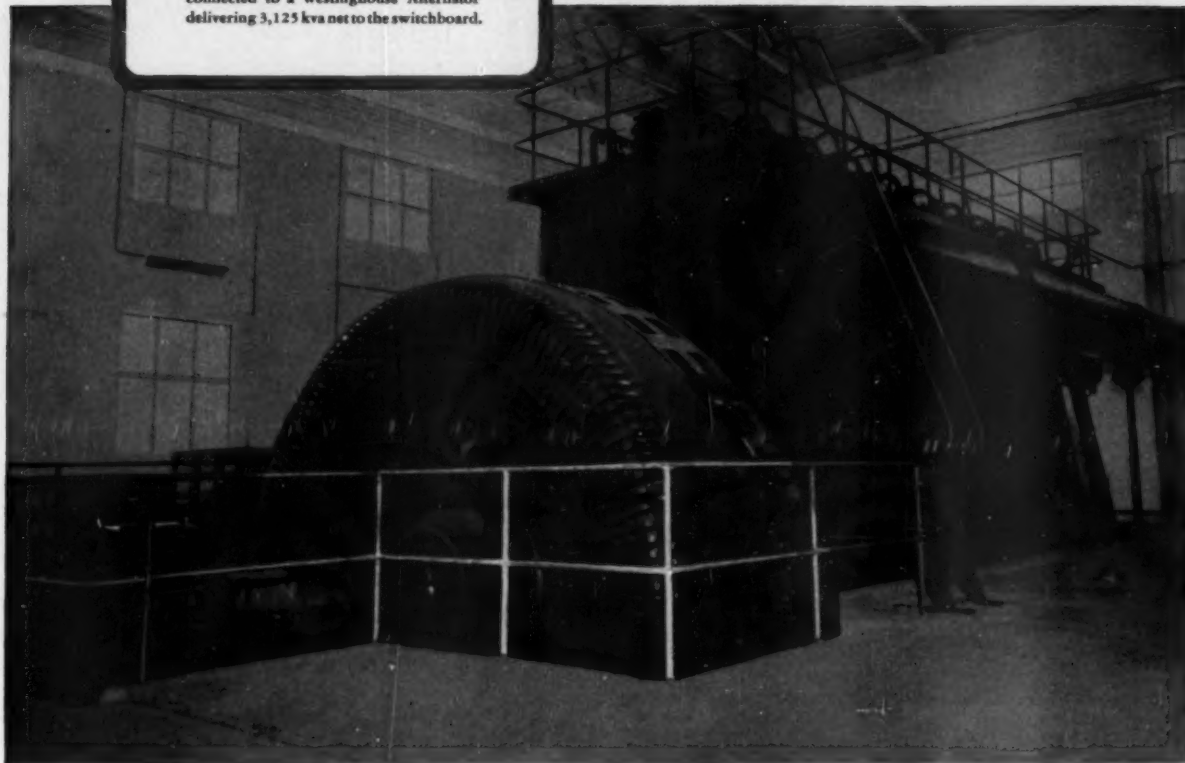
Position

Address

City State



This is the first American-made engine generator unit installed at the power plant of the Bermuda Electric Light Co., Ltd. The Nordberg Diesel Engine is direct-connected to a Westinghouse Alternator delivering 3,125 kva net to the switchboard.



This generator unit turned the tide at Bermuda

Here is the first American generator unit installed at the Bermuda Electric Light Co., Ltd. Prior to 1939, all the generating units were of British make. This unit changed the pattern . . . consisted of a Westinghouse Generator and a Nordberg Diesel Engine. The outstanding performance of this unit was responsible for another similar installation in 1950.

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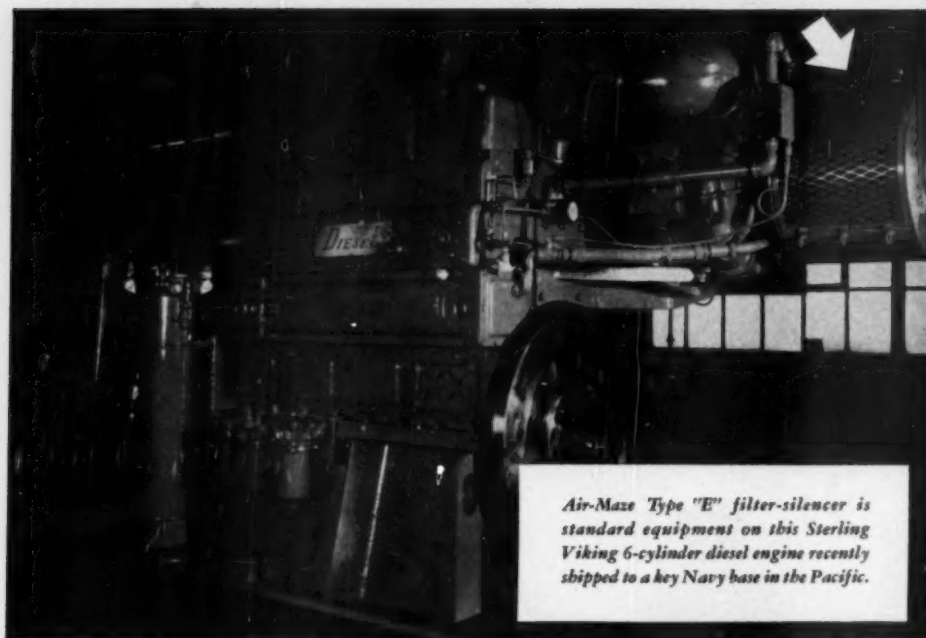
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Air-Maze Type "E" filter-silencer is standard equipment on this Sterling Viking 6-cylinder diesel engine recently shipped to a key Navy base in the Pacific.

Air-Maze filter-silencer cuts wear and noise on Navy's new Sterling Viking diesels

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as well as square types incorporating flat panel cells. Both curved and flat panels are specially constructed to provide maximum efficiency over a wide range of air velocities. They are easily removed for servicing.

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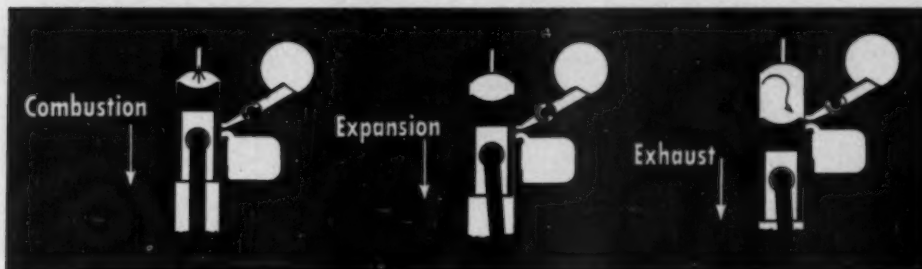
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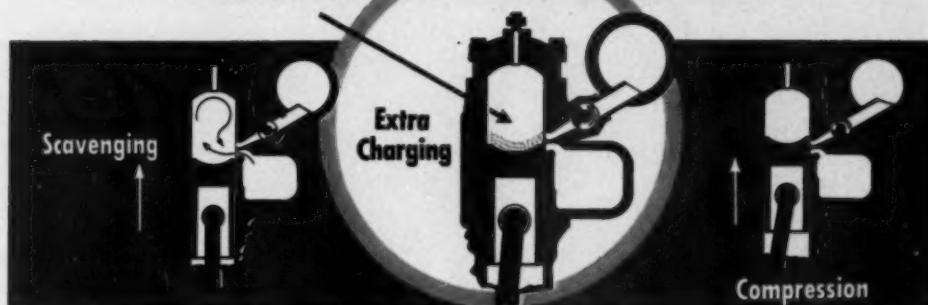


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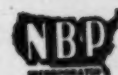
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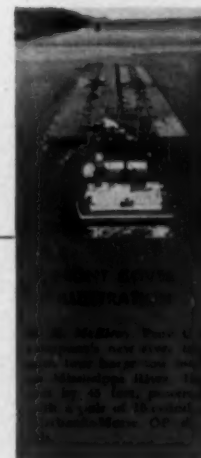
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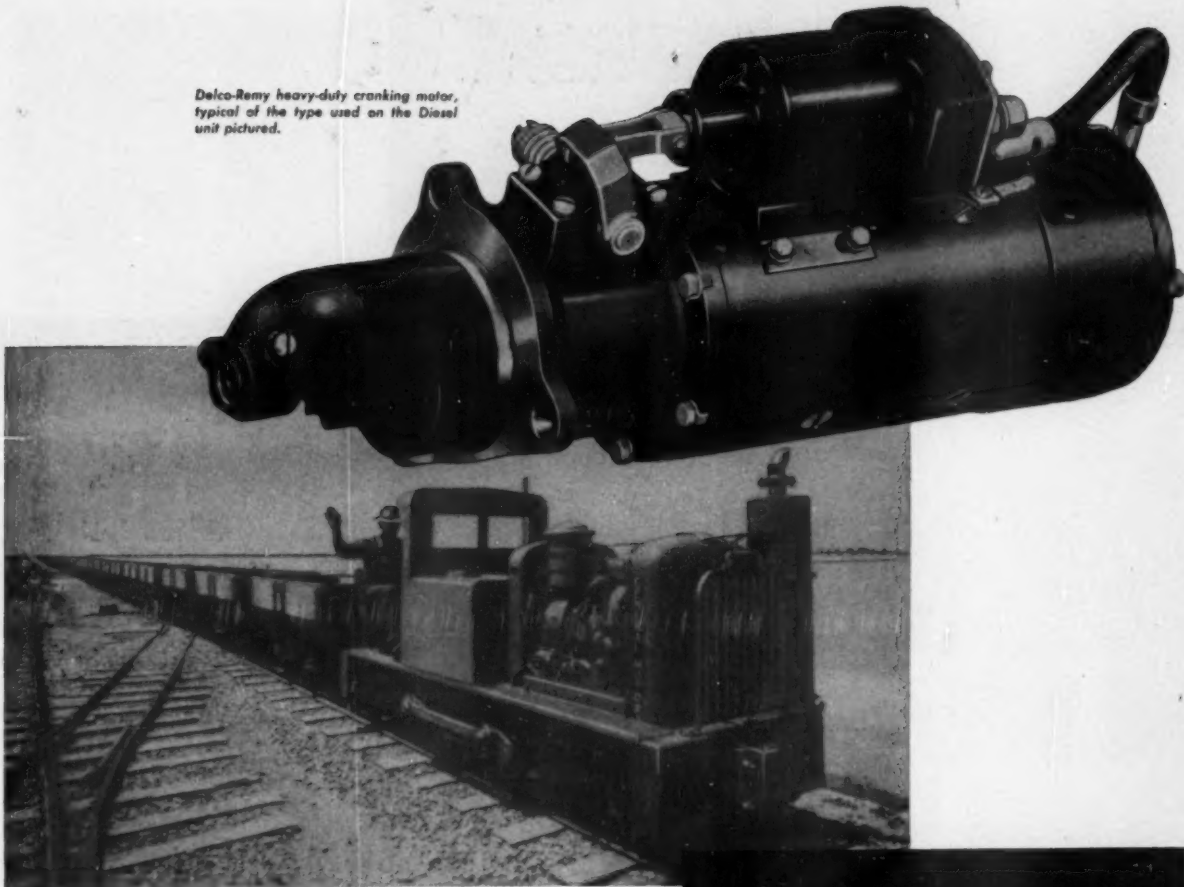
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typical of the type used on the Diesel
unit pictured.*



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• WHEREVER WHEELS TURN OR PROPELLERS SPIN

BIG ECONOMIES USING SEWAGE-GAS FUELED ENGINES

By JAMES JOSEPH

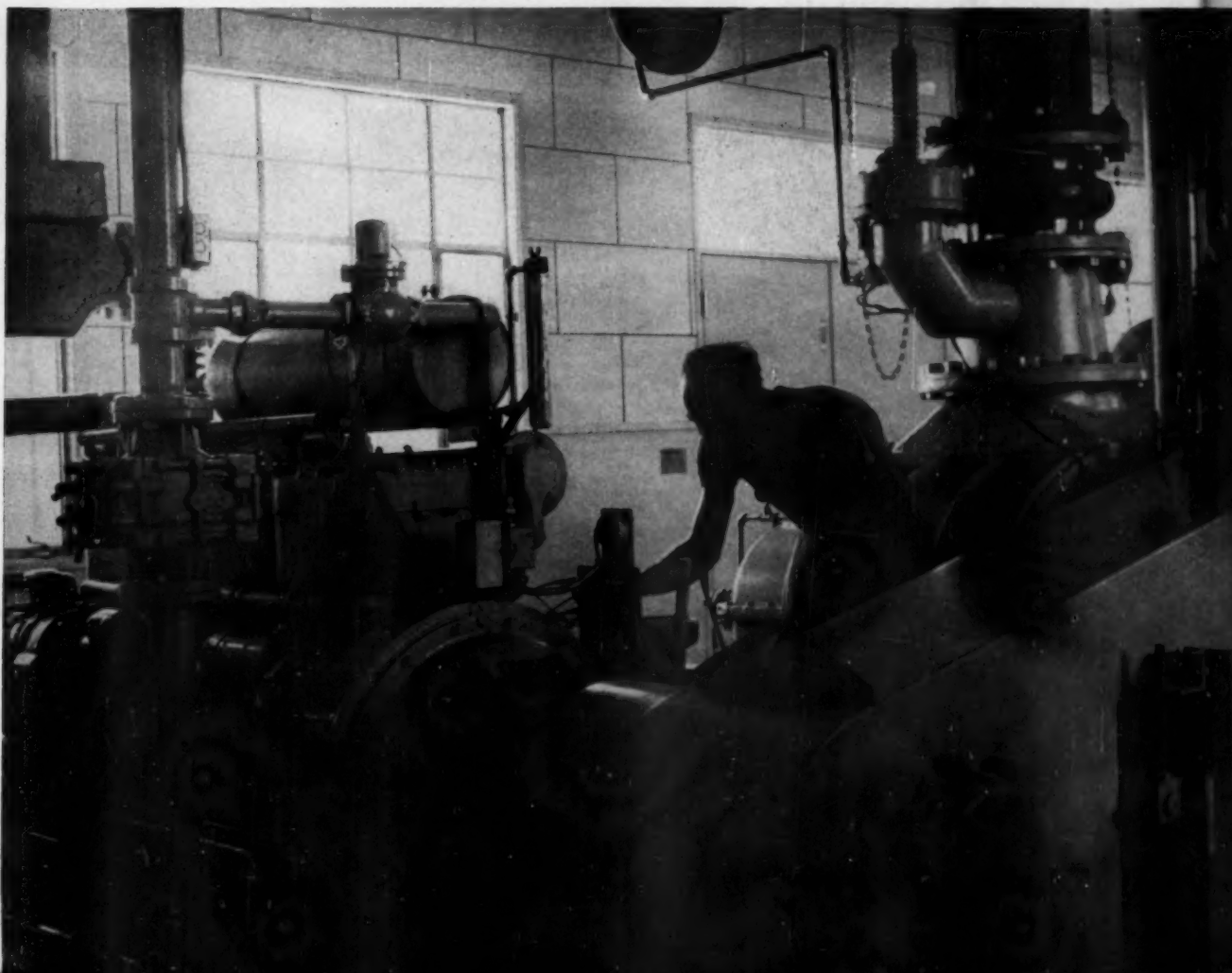
WITHIN the last few years, several score small to large sewage disposal plants have been built in California, most of them designed with dual-fuel engines, using sewer sludge gas about 99% of their running time. Dual-fuel installations, with sewage gas as the prime fuel, is not particularly an innovation, but these installations are more prevalent in the west—mainly because western sewage seems to create gas with a sufficiently high btu. for efficient engine operation. Sewage gas must contain 550-600 btu. per cu. ft. for proper combustion. Sewage disposal engineers estimate that the per capita production of sewage gas is about $\frac{1}{4}$ to $\frac{3}{4}$ cu. ft. per day in the east; approximately 1 to 2 cu. ft. per day in the west. Much of this additional gas is credited to wider western use of garbage disposers, which dump into the sewer system vegetable and fruit grindings.

If a recent, and much-publicized report by Los Angeles County's chief engineer of Sanitation Districts, A. M. Rawn, is a look into the future, then increased sewage gas production is probable in the west. Rawn suggested, after several years research, that Los Angeles County construct garbage-grinding facilities, replacing garbage dumps. This would throw into sewers an increased amount of gas-producing sewage. And thus even more sewage gas for the big dual-fuel installation at Los Angeles' Hyperion Activated Sludge Plant, where nine 1688 hp. Worthingtons operate on sewage sludge gas. Dual-fuel installations usually use natural gas or

occasionally gasoline for standby. Sewage gas, because of impurities, calls for modifications in engine operation. Typical of the smaller California plants operating dual-fuel is the \$286,000 activated sludge plant, owned by the City of Colton. Installed at the plant is a Buda, Model JL-1335, natural gas, sludge-gas fueled 50 hp. engine, with 1335 cu. in. displacement. The Buda belt-drives a Sutorbilt blower which discharges 2800 cfm. free air against a gauge pressure of 5.0 psi. The blower supplies oxygen to the primary Currie clarifier tank—speeding bacteria action. The engine is equipped with a fuel-gas mixer, operating on 600 btu. gas from the two sludge digester tanks. The blower, delivering air via a 14-in. steel pipe, supplies 8.5 cu. ft. of air per gallon of sewage in the aeration process.

Colton Buda, with Vapor Phase equipment, drives blower which circulates air into the sewage thus speeding up bacteria action.

29



The plant, which has been in operation since 1950, is designed for a population of 65,000, and for a maximum daily capacity of 5,000,000 gallons of sewage. It is presently handling only about 3,000,000 gals. per day, thus is large enough to handle twice the present population of Colton. Several features of the Colton dual-fuel installation are interesting: (1) Vapor-Phase engine cooling, utilizing otherwise wasted heat to warm sludge in digesters, thus increasing gas output; (2) elimination of corrosive condensates through V-P system, protecting valves and cylinders; (3) dual-regulator which automatically switches to natural gas if sewage gas falls below 550-600 btu. content; (4) larger engine that might ordinarily seem design-wise, motivated by need for handling larger quantities of gas with fewer btu.'s per cu. ft.

In the last several years, DIESEL PROGRESS has carried reports on several successful Vapor-Phase installations, among them, a V-P equipped 40 hp. Enterprise 1000 rpm. engine operating on raw sewage gas in the Visalia, Calif., activated sludge plant. This engine went into operation on July 1, 1939, and during an 11-year period to April, 1950, ran up a record 95,511 hours on untreated sewage gas, which is highly acid, with engine repair costs totaling \$411.94. In a recent plant expansion, Visalia has installed 3 Budas, Model 0893.

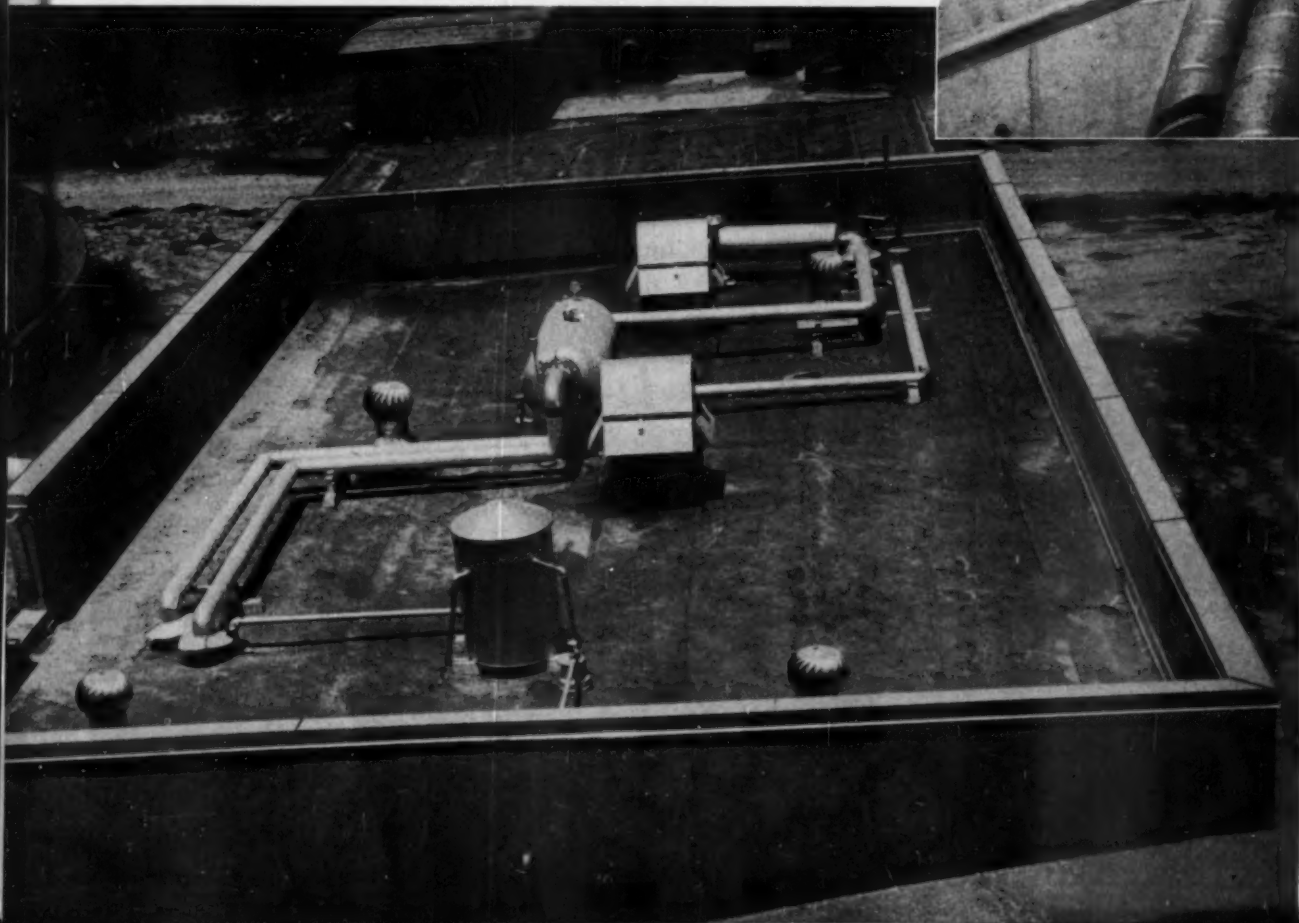
One of the problems in using sewage gas as a fuel involves impurities inherent in untreated sewage gas. There are fairly large quantities of carbon

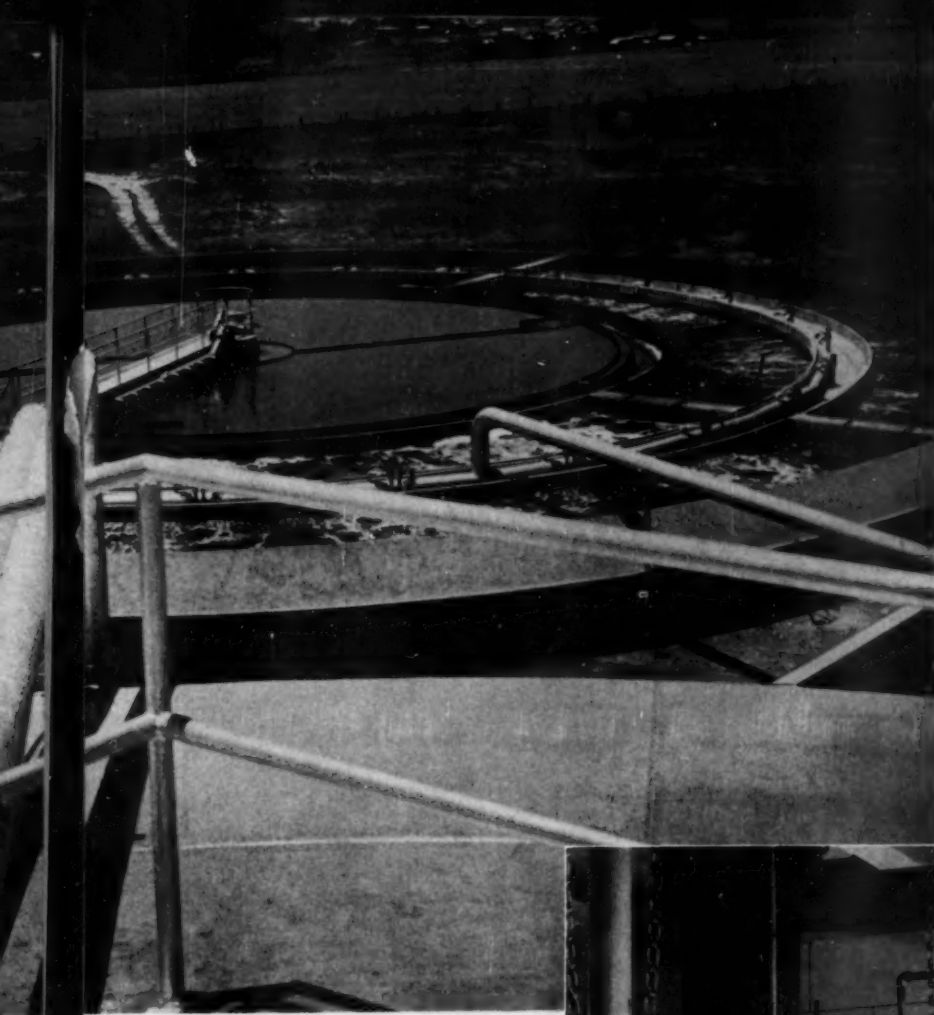
dioxide, carbon monoxide, methane and hydrogen sulfide in the gas. When engines were cooled by radiators, they were run cold, at about 140°. However, this allowed condensation of the various sewage gas acids on pipes, valves and especially on cylinder walls. The impurities condensed, often-times forming sulfuric acids. With Vapor-Phase, the engines are run hot—above the dew point of sewer gas, which is about 194°F.

Typically, the Colton Buda is run at 212°F., preventing condensation. Circulating water is never cooled as it flows from the V-P unit to and through the engine and back to the V-P unit. The natural law of boiling controls the temperature. Since in the operation of V-P, cooling water is boiling all the time that the engine is running, untreated sludge gas, direct from the digesters, can be used without harmful effects. Without the presence of moisture in engine components, the H_2S present in sludge gas cannot form into acid. Thus, with the entire engine water jacket above the dew point, no acid is formed. Neither must expensive gas scrubbers or similar devices be installed.

At Colton, two closed water circuits are used. Engine water circulates from the V-P unit through the engine jackets and exhaust boiler where all waste heat is accumulated in the V-P unit. Steam is separated from water in the V-P unit. The secondary circuit merely pumps water from the 200-300-ft. of 2-in. iron radiator pipes, which comprise the digester tank heat exchanger, to the V-P unit.

The Vapor Phase unit atop the Colton sewage plant showing the simplicity and compactness of a Vapor Phase installation.





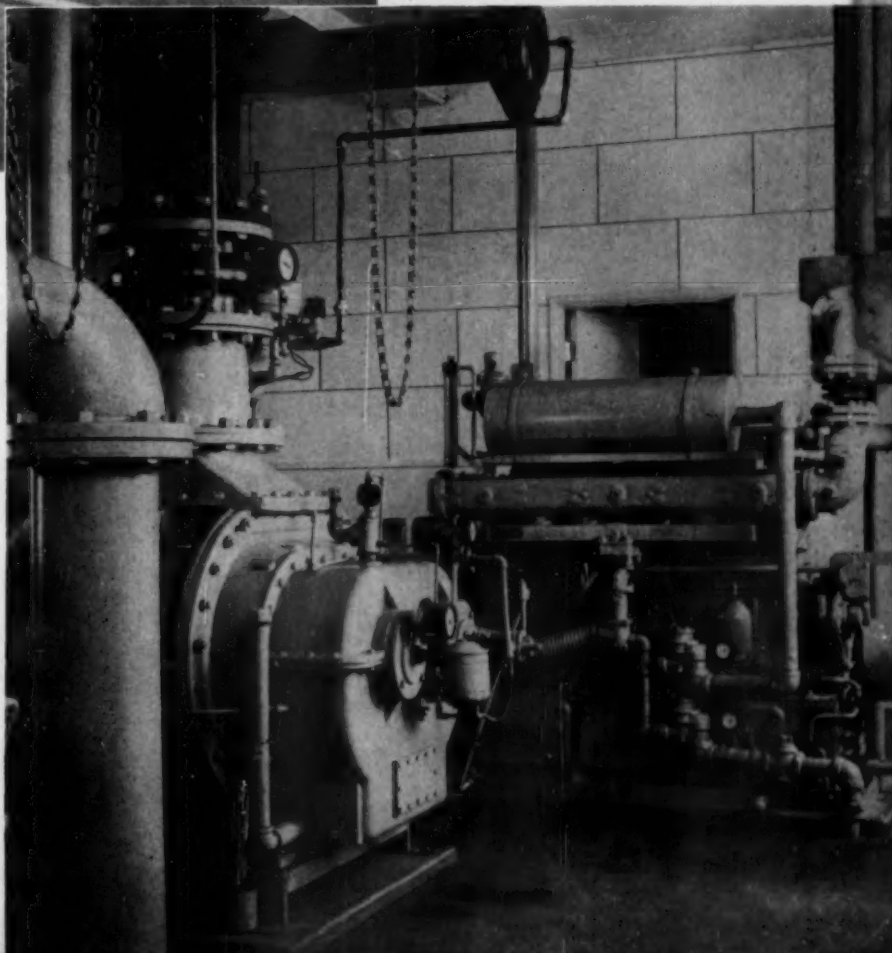
The Colton Buda operated 2934 hours, with but 9 oil changes totalling 7.75 gals. of make-up lube oil. An Ensign carburetor receives gas from either the sludge gas or natural gas regulator. A venturi depression on the carburetor regulates use of the gases. Engine cooling water is circulated through the jacket by a $\frac{1}{4}$ hp. electric motor, 50 gpm. The blowers, there's one for standby, discharge to the Currie Clarifier via a 14-in. steel pipe. In deciding what size of engine was needed for the Colton job, Buda engineers had to take into consideration the much lower btu. content per cu. ft. of sewage gas compared to btu. content per cu. ft. of natural gas. It requires in the neighborhood of 28 cu. ft. of sewage gas to equal the same btu. hours as 10 cu. ft. of natural gas. This means that a much larger quantity of gas must go through the engines using sewage gas. Thus, instead of running the Colton Buda at the rated 860 rpm, it is slowed to about 550 rpm. This same engine, which could develop 150 hp. under operation by another fuel, is cut down to about 50 hp. Regardless, the savings in fuel more than makes up for the higher original outlay for the larger engine. Engineering consultant for the Colton plant was the Currie Engineering Company. E. E. West is Supt. of Utilities for the city of Colton.

Currie Clarifier at Colton, California. Pipe at extreme right delivers hot air from Vapor Phase to sewage.

The Colton Buda installation working on dual-fuel with Sutorbilt blower in foreground.

where it circulates through a built-in tube bundle, condensing the steam, thus cooling the engine water and transferring the heat to the sludge. Engine jacket water leaving the Buda at 212°F. condensates in the V-P unit, and returns to the engine at 208-209°F. The secondary closed circuit to the digesters leaves the V-P unit at 120°F. drops 20° in the sludge-heating process, and returns to cool the jacket water at 100°F. The steam produced is in its most usable form (low pressure, 1 to 15 psig.). Meantime, the sludge, which must be maintained at about 94°F. or above for effective bacterial life (for bacteria creates the engine's gas), is warmed, creating more gas. Digestion continues for from 3 to 6 months in the two, 50-ft. diameter digester tanks at Colton. Then, sludge is piped to a drying basin, out of doors, where it is eventually sold as fertilizer.

Economy-wise, the plant creates its own fuel, a savings over natural gas as fuel of about \$350 per month. Except for the first few weeks, before the bacteria had created the necessary gas with the required btu. content, the Buda has been on sewage gas. Occasionally, as with all plants of this type, a sudden change in the characteristic of sewage (large outfall from an industrial plant, etc.) will lower btu.'s below operating point, and then regulators on the engine kick in the natural gas supply.



GIMBEL'S and Saks Fifth Avenue, New York, are ready for emergencies, which may cause failure of normal power supply, with recently installed automatic diesel generating units. Soon to be similarly protected is Gimbel's in Pittsburgh. The emergency generating units are identical for the three stores, the first installation having been made in Gimbel's New York. These units consist of a diesel engine with all necessary operating accessories, generator, control panel and automatic transfer switch. They are self-contained units capable of operating independently, having their own starting motors, drawing current from storage batteries which are charged by engine-mounted charging generators.

The purpose of these generating sets is to supply current instantaneously, in the event of normal power failure for lighting all floors, exits and fire escapes and for public address systems. Before selecting diesels for this vital service, however, Mr. Carl F. Hoffbauer, chief engineer of Gimbel's made an exhaustive comparison of the merits and costs of battery lighting units versus the diesel generat-

ing units and found a number of outstanding advantages in favor of the diesel sets which are set forth in a report to his management, as follows:

Authorization for completion of the emergency diesel engine generator installation based on \$6,000.00 engine and \$7,000.00 wiring estimate did not include any allowance for engine installation, which consists of setting a foundation, labor to place unit from point of delivery and setting on foundation. Hooking up a five inch exhaust manifold from engine to stack.

However, after making a complete survey of this problem, I noticed that by making certain changes in the circuit wiring and setting the unit in the third basement instead of the driveway would reduce the wiring cost 40%. Re-estimating on this basis reduced the cost from \$7,000.00 to \$4,780.00. If this change was not made the wiring cost would have been about \$8,000.00. Included in this cost of \$4,780.00 is the complete emergency lighting and the public address system which was not included in the \$7,000.00 estimate.

Emergency Lighting Units Per Floor

Floor Load	No. of Lt. Units	Watts	Watts
Stair lights	16	100	1600
Exit lights	8	25	200
Night lights	5	100	500
General lights	4	150	600
Total Watts/floor.			2900

Floors: $2900 \times 14 = 40,600$ watts; P.A. system, 1,000 watts = Total 41.6 kw.; General Normal Reserve 50 kw., Reserve 8.4 kw. No. of Units/floor, $33 \times 14 = 462$ total light units in building.

If the same number of light units were used by batteries the cost of the equipment would be \$33,130.02, estimated wiring cost of \$7,000.00 = Total cost would be \$40,130.02.

In the original estimate 150 units were decided upon, giving an average of 10 units/floor against the 33/floor, with the generator system we still have a reserve of 8.4 kw. and could put sixty more 100 watt lamps into service without overloading.

NOBODY-BUT NOBODY-OUT PLANS GIMBELS

By WILBUR W. YOUNG



Net Savings Against Estimated Budget

Estimated Budget Cost			
Diesel Gen. Unit.	\$6,000.00		
Electric Installation	7,000.00		
Installation	1,000.00	\$14,000.00	
Actual Cost			
Diesel Gen. Unit	\$6,185.00		
Electric Installation	4,780.00	\$10,965.00	
Foundation			
1 Mechanic—3 hrs.	\$ 12.60		
1 Laborer—4 days	44.00		
1 Machinist—1 day	13.60	\$ 70.20	
Setting Engine			
4 Men—4 hrs.			
16 hrs. average \$12.00/hr.		\$ 192.00	
Connecting Exhaust Manifold			
1 Engineer—2 days	\$ 36.00		
1 Helper—2 days	24.00	\$ 60.00	
Cost of Material			
	\$ 62.00		
Total Cost		\$11,349.20	
Net Savings		\$ 2,650.80	

The installation of the diesel unit provides the following advantages over battery installation:

1. Eliminates battery recharging or purchase of new batteries when required.
2. Original estimate figured only 150 battery units. We now have 462 light units and P.A. system control.
3. Enormous amount of labor required to check and service battery units eliminated.
4. We have a reserve capacity of 8.4 kw. which permits installation of 60 more 100 watt lamps and still be within the normal 50 kw. load limit.
5. The installation cost/unit is much less than battery units.

Battery

150 units @ \$71.71	\$10,756.50	
Wiring	7,000.00	\$17,756.50

Generator

462 units	\$ 6,185.00	
Wiring	4,780.00	\$10,965.00

Unit cost: Battery \$118.38; Generator \$23.71.

6. Placing the unit in the third level basement instead of the driveway gives more protection in the event of a bombing.

The generator set is equipped with a generator control switch, an automatic transfer switch and automatic starting controls. Mounted on the generator control switchboard are electric instruments (voltmeter, ammeter, frequency meter), automatic voltage regulator for keeping the emergency power voltage constant under all load conditions, exciter field rheostat for adjusting the generator voltage manually in case of voltage regulator trouble, necessary instrument switches and transformers, etc. and an air circuit breaker which protects the generator against overload and short circuits and also serves as a means of disconnecting the generator from the system.

The automatic transfer switch is basically a three pole double throw switch for automatically connecting the load to either the normal power supply or to the emergency generator. The transfer switch is mounted in a wall cabinet which includes also a number of auxiliary relays and part of the automatic engine starting controls.

When the voltage of the normal power line in any or all phases drops below 70% of normal, the automatic starting controls will start the emergency generator set. As soon as the emergency voltage builds up to rated voltage and frequency (120/208

volt, 60 cycle)—it doesn't take more than a few seconds—the automatic transfer switch will connect the emergency generator to the load circuits. The emergency generator set will run and supply power to the load as long as the failure of normal power exists. When normal power is restored in all phases for approximately fifteen seconds, the transfer switch will reconnect the load to the normal power and the set is shut down manually.

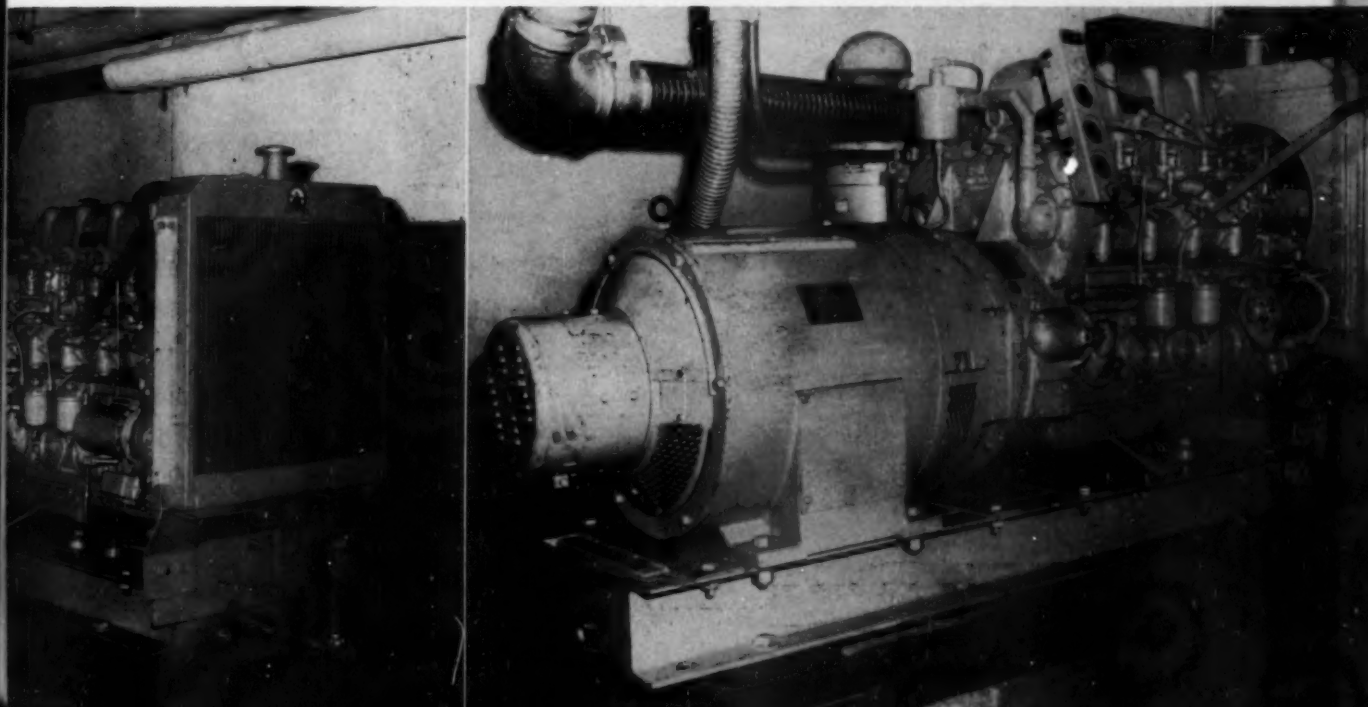
This emergency generator set embodies various protective and safety devices to insure proper operation and maintenance of the set. A test switch is provided to simulate normal power failure—the set will start automatically and transfer the load to the emergency set. Another test switch enables the operator to start the set electrically without having the load transferred. A starting control disconnect switch is provided to disconnect the automatic starting controls entirely to prevent starting the set during maintenance or repair work. When the automatic (electric) starting controls are disconnected or in case of any trouble in the automatic starting system, the generator set may be started manually by means of a starting push button on the engine instrument panel.

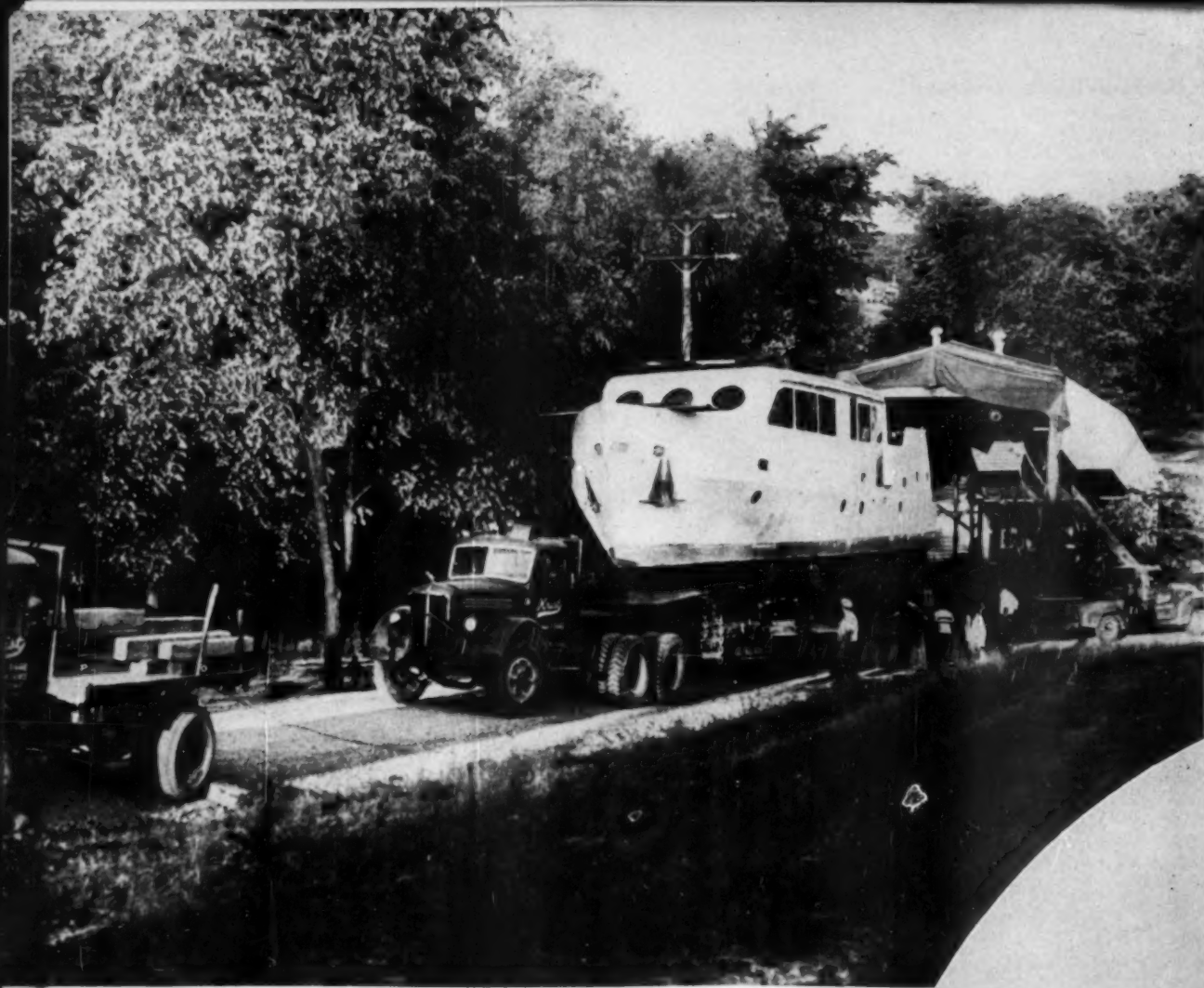
Equipment List

Diesel generating unit—International Ferromont Machinery Co.
 Engine—4½ in. bore, 5½ in. stroke, 80 hp. 1200 rpm—Harnischfeger Co.
 Generator—50 kw. 60 cycle, 240 V., 3-phase—Electric Machinery Mfg. Co.
 Starting System, Batteries, Motor and Charging Generator—Electric Auto-Lite Co.
 Intake Air Filter—Donaldson Company.
 Exhaust Snubber—Burgess-Manning Co.
 Fuel Filters (two)—Commercial Filter Co.
 Engine Isolation (Cork)—Vibration Eliminator Co.
 Ammeter and Voltmeter—Westinghouse.

Mr. Carl F. Hoffbauer, chief engineer of "Gimbels," New York, inspects the diesel emergency generating unit.

In this view of Gimbels emergency generating set may be seen Donaldson intake filter, Electric Machinery generator and Vibration Eliminator cork isolation units.





DIESEL YACHT "SEAQUESTER"

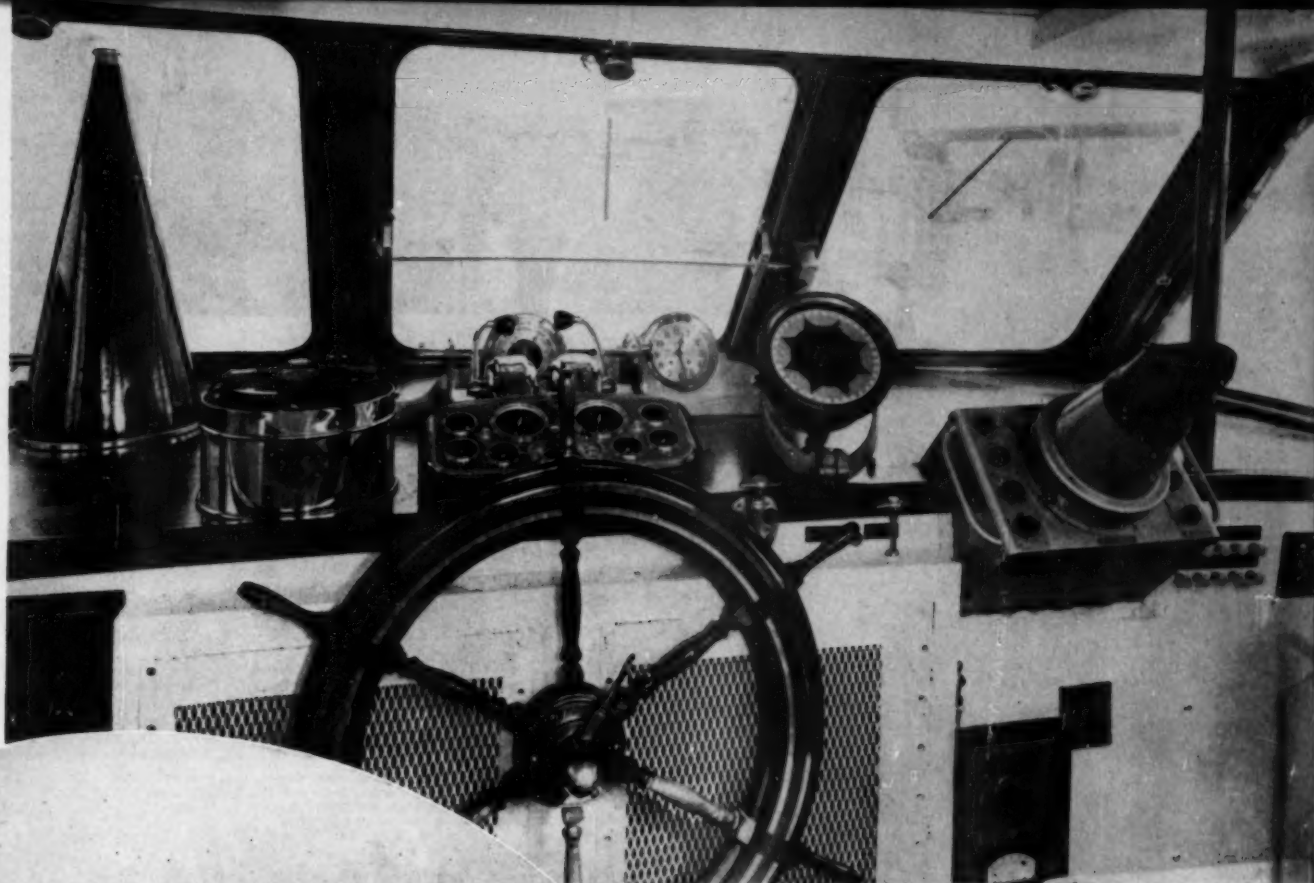
WHEN the 63-ft. yacht *Seaquester* was completed early last fall she literally started her maiden voyage from a ravine 50-ft. below street level in her owner's back yard near Birmingham, Michigan. Birmingham, a suburb of Detroit, is 20 miles north of the Detroit River and can boast a waterway no greater than a creek. This, of course, offered no solution to the problem of getting this sleek dieselized craft to water. But, regardless of the problems involved, Walter F. Carey, one of Detroit's young industrialists, wanted his boat built close to his home so he could "see it grow." When the boat was finished, Carey turned the initial job of navigating it over to an ingenious house mover. It took one day to get the boat up and out of his yard. It took two more days rolling over 40 miles of dry city streets before the craft felt water lapping at her hull.

The *Seaquester* is 62-ft. 8-in. in overall length, 16-ft. 9-in. in beam and has a depth of 7-ft. 9-in.

amidships. She displaces 70 long tons of salt water when fully fueled and provisioned. Of all steel welded construction the hull incorporates a double chine design based on experimentation in this field by Professor L. A. Baier, Director of the Department of Naval Architecture at the University of Michigan. Adaptation of this design to yacht use was accomplished according to plans developed by the naval architect, Richard D. Jacobs II, of Wayne, Michigan. The craft has two full-headroom cabins on the main deck and an open observation deck. A fishing cockpit aft has three fishing chairs. Outside decks are floored in 2-in. teakwood; main deck cabins in cork tile. Walls in the main cabin are finished in woven Philippine matting decorated with maps burned and painted in leather.

An unusual safety feature for a vessel of this size is the bulkhead arrangement. She has water-tight collision bulkheads fore and aft and in addition has water-tight bulkheads fore and aft of the engine





room. The vessel is thereby subdivided into three main separate watertight compartments in addition to the chain locker forward and the collision bulkhead aft. She boasts a complete double bottom and carries 1400 gallons of fresh water and 2000 gallons of fuel oil therein.

Main propulsion is provided by a matched pair of General Motors Series 71 200 hp. marine diesels. They are mounted on "Vibration Eliminator" shear rubber mounts and turn three-bladed Columbian Style 1 bronze propellers 37-in. by 29-in. through 3:1 reduction gears. A top speed of 14 mph. is provided. Two 20 kw. generators, each powered by a General Motors 2-cylinder diesel engine supply 110 volt a.c. single phase power. Propulsion engines exhaust under water. The generator engines exhaust either under water or through Maxim silencers above water. The galley is fitted with a 15 cu. ft. deep freeze, a 10 cu. ft. refrigerator, an automatic washing machine, dishwasher, garbage disposal unit, three-burner electric stove, automatic oven and an electric barbecue oven.

Engine instrumentation on the bridge includes tachometer, oil pressure and water temperature gauges, battery charging ammeters and an alarm and warning light system covering both the main engines and the generator engines. She also carries two one-mile ray 800 watt searchlights and a triple trumpet air horn. Navigation equipment is complete with radar, radio direction finder, depth recorder and gyroscopic compass.

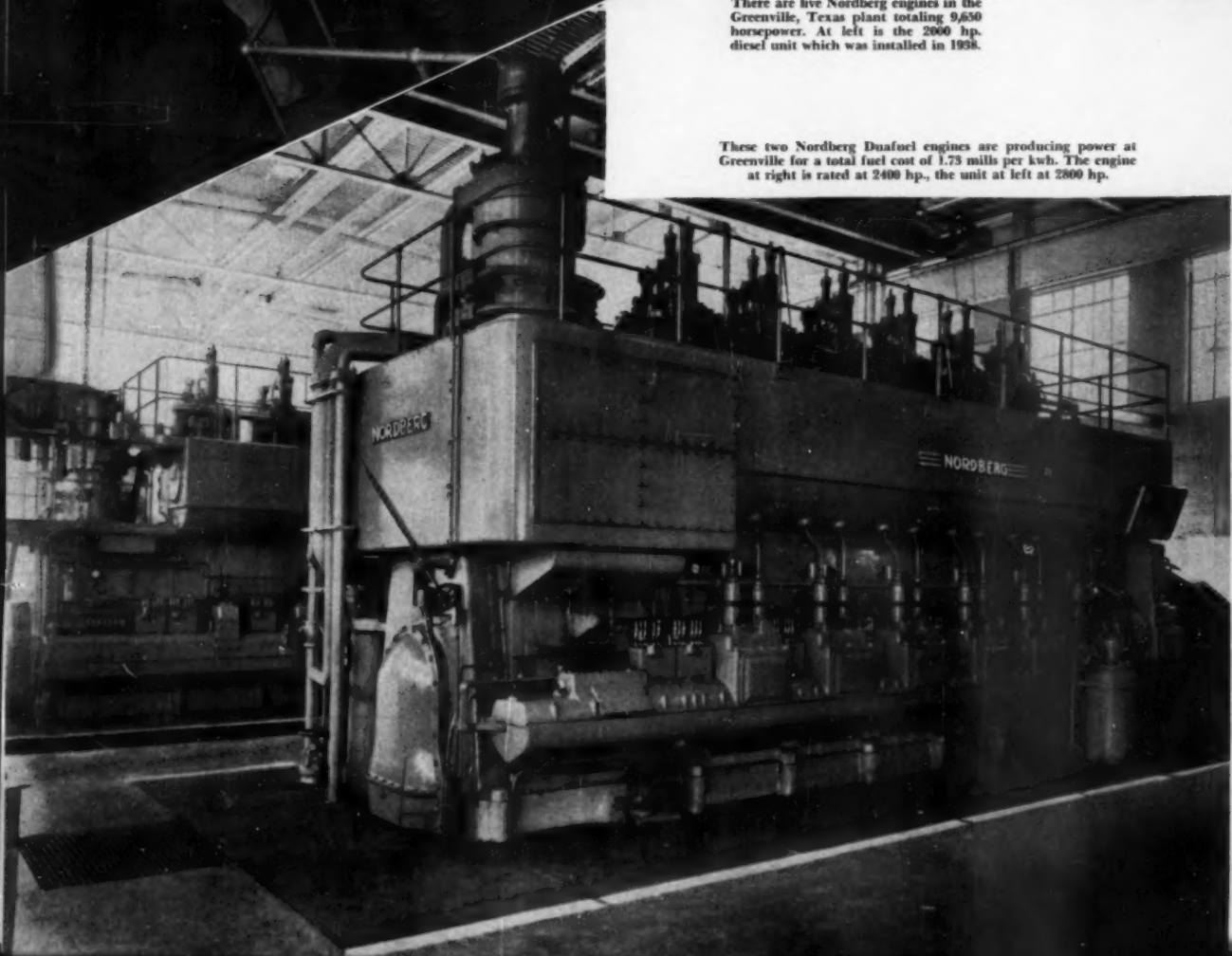




There are five Nordberg engines in the Greenville, Texas plant totaling 9,650 horsepower. At left is the 2000 hp. diesel unit which was installed in 1938.



These two Nordberg Dualfuel engines are producing power at Greenville for a total fuel cost of 1.75 mills per kwh. The engine at right is rated at 2400 hp., the unit at left at 2800 hp.





The Greenville, Texas municipal power plant has contributed nearly \$1,500,000 to the city in ten years. The recently completed plant extension at right will house a new 4,050 hp. Nordberg low pressure Duafuel engine.

GREENVILLE, TEXAS

First Texas City To Operate Municipal Utilities Finds Record Economy in Power Production With Nordberg Duafuel Engines

TWO Nordberg Duafuel engines in the Greenville, Texas municipal power plant generated 17,992,820 kwh. last year at a total fuel cost of just 1.73 mills per kwh. These two-cycle units burn natural gas at high pressure with a small quantity of pilot oil to stabilize combustion. The six cylinder engine, with 21½-in. bore and 29-in. stroke, is rated at 2400 hp. at 225 rpm. and was installed in the spring of 1942. The seven cylinder Nordberg unit, rated at 2800 hp., was installed in June, 1947. In the fiscal year ending April 9, 1950, these two engines produced 17,992,820 kwh. while consuming 189,284 mcf. of natural gas and 76,921 gal. of pilot oil. This meant an average consumption of 10.52 cu. ft. of gas and .0043 gal. of oil per kwh. The gas cost \$23,821.93 and the oil cost \$7,307.50, giving an average of 1.32 mills per kwh. of gas and 0.41 mills for oil, a total fuel cost of 1.73 mills per kwh.

To achieve this production, the gas engines worked a heavy schedule. The smaller unit was in operation 6,193 hours during the year and the larger ran 8,329 hours, actually more than 95 per cent of the time. Gas engine production was 83 per cent of the plant total of 21,487,322 kwh. The remaining 3,494,502 kwh. were generated by the plant's three

Nordberg diesel engines: a 1,000 hp. and a 1,450 hp. unit installed in 1933 and a 2,000 hp. engine installed in 1938. All three are 17½ x 25 in. mechanical-injection, two-cycle diesels developing rated horsepower at 257 rpm. The diesels consumed 269,635 gal. of fuel oil during the year at a cost of \$22,736.96, an average of 12.95 kwh. per gal. of fuel at a cost of 6.51 mills per kwh. Thus, the Duafuel engines cut the fuel bill 4.78 mills per kwh., a slash of 73.4 per cent. The use of economical Duafuel engines instead of oil-burning units in the year cited meant a saving to the city of more than \$86,000.00.

As a result of the excellent production of the Duafuel engines and the efficiency of all five Nordberg engines in the plant, Greenville has ordered another Nordberg Duafuel unit. Rated at 4,500 hp., this two-cycle engine was scheduled for installation in October of this year and will operate on natural gas on the low pressure system. Another engine of the same capacity and specifications is planned for installation in the near future. At this time, cost per kw. will be lowered due to the fact of the use of gas for fuel and using the fuel oil engines for standby service in the generation of the total electric power.

Greenville was the first city in Texas to own and operate its utilities, setting up its first electric power plant in 1887. First prime mover was a 50 kilowatt steam engine, followed periodically by larger and more modern steam units. The last steam installation came in 1925 when a 1250 kw. General Electric turbine was put into service. This unit is still in the plant and provides standby protection. The plant had its financial and physical operating difficulties in the early days but has been consistently profitable since the advent of diesels. Since the Nordberg Duafuel engines took over the bulk of the load, profits have been greater than ever. In the fiscal year ending April 9, 1950, the electric department had a net revenue of \$442,433.12. Generating costs, including depreciation, were \$161,968.79; distribution costs with depreciation were \$64,956.42; and general and administrative costs were \$27,717.22, making a total of \$254,642.43. This left a net profit of \$187,790.69 for the year. The utilities department turned over \$160,000.00 to the city treasury. Commissioner of Utilities Scott Wright points out that the municipal utilities have contributed more than \$1,200,000.00 in ten years to help operate the city and have contributed an additional \$250,000.00 in free service.

"We feel that we could not operate our city without this plant," says Mr. Wright. The depreciation reserve is not just an entry on the books but actual money in the bank which is used only for replacement of equipment. At present the power plant has no indebtedness but there is \$186,913.64 in cash in the utilities replacement fund. In addition, there was at the end of the fiscal year cited the sum of \$85,674.26 in the operating fund.

The high profits of the Greenville plant can be attributed directly to low operating costs. Not only do the Nordberg Duafuel engines utilize an economical fuel but are efficient in fuel consumption. The city is close to abundant supplies of both oil and natural gas and pays only 12.5 cents per mcf. for gas. By comparison, the \$6-38 gravity distillate oil used for pilot fuel is expensive at 9 cents a gallon. One of the virtues of these engines is their ability to operate with exceedingly small charges of pilot oil. Consumption of 10.52 cu. ft. of gas and .0042 gal. of oil per kwh. means that pilot oil has been cut to a lean five per cent.

The plant has a separate 50,000-gal. tank for pilot oil storage several yards up a hill. Oil flows by gravity to a 4,000-gal. supply tank and then through duplex filters to the engines. The No. 4 (2400 hp.) engine also has a 5 gal. fuel tank with a float-controlled admission valve. The No. 5 (2400 hp.) unit's fuel supply pump receives oil direct from the 4,000 gal. tank. On both engines there are individual pilot oil injection pumps for each cylinder, permitting accurate metering of the small oil charge. The natural gas is regulated, metered and fed to the 3-stage compressors on the engines where it is raised to 1150 lb. pressure for injection into the cylinders. Admission of the gas is controlled by hydraulic actuator pumps. In the case of the No. 5 engine, the regular diesel fuel injection pumps serve as actuators. Both engines can be converted to full oil operation but gas supplies are abundant and there is little chance that conversion will be necessary.

TABLE I
Fiscal Year Ending April 9, 1950

Net Operating Revenue	\$442,433.12
Generating Cost Including Depreciation:	
Superintendence & Labor	\$31,777.80
Fuel, Oil	33,360.38
Fuel, Gas	23,821.93
Water	560.00
Lubricants	6,403.72
Maintenance:	
Structure & Grounds	114.90
Engines	7,036.33
Misc. Equipment	21.49
Station Expense	2,530.49
Station Labor	2,341.75
Depreciation	54,000.00
TOTAL	\$161,968.79
Distribution Cost Including	
Depreciation	64,956.42
General and Administrative	26,717.22
Total Operating Cost Including	
Depreciation	253,642.43
Net Profit	\$188,790.69

Plant Superintendent G. C. Pullen reports that the gas engines are easy to lubricate and to keep clean. The main pressure lubricating circuit which supplies the bearings includes a shell-and-tube oil cooler and a full-flow strainer. Some oil is bled continuously from the pressure side of the circulating pump to a fuller's earth purifier. There is also a motor-driven auxiliary lube oil pump for

each of the big engines. Cylinders are supplied with oil by a separate force-feed mechanical lubricator for each cylinder. The cooling water system is arranged for maximum flexibility and to permit easy expansion when the new Nordberg engine is added. Jacket water and raw water headers in the basement run along the engine foundations. The headers are extended and a new motor-driven centrifugal pump is hooked to each when a new engine is installed. A big atmospheric-type cooling tower serves the entire plant. City water from the adjoining water plant is used for makeup. The power plant has just increased its softener capacity with installation of a zeolite-type softener. All engines have the protection of intake air filters, impingement-type for units 1, 2, 3 and 4, and an automatic self-cleaning filter for No. 5. In the last three years, engine maintenance has been just 55 cents per horsepower per year. This includes all the engines some of which have been in service for more than 17 years. For the entire plant, operating costs before depreciation averaged only 5 mills per kwh. in the fiscal year cited. This includes superintendence and labor, fuel, water, lube and maintenance. With full depreciation, the plant's cost total was 7.5 mills per kwh.

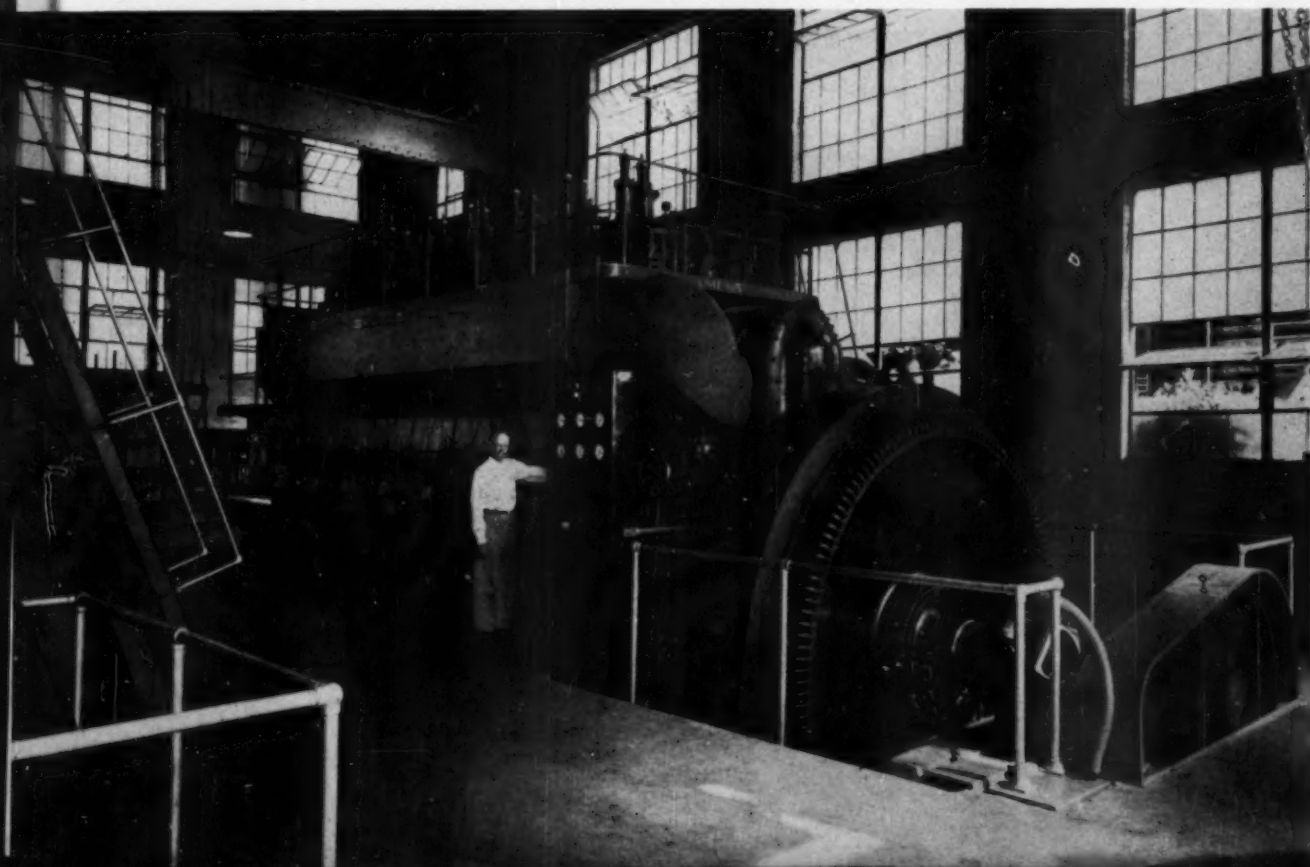
Greenville celebrated its 100th year in 1950 and is continuing its vigorous growth. There are numerous industrial plants but the bulk of the load on the municipal power system is commercial and residential. The demand has reached 5,000 kw. peaks in the summer when air conditioning equipment is in full operation. Mayor John H. Miller,

Commissioner Wright, Commissioner #2 W. L. Sommers, and other progressive city officials recognized that the demand soon would outstrip plant firm capacity. Consequently, Greenville already has completed a plant addition large enough to house two 4,500 hp. Nordberg low pressure Dualfuel engines. If they do no more than match the performance of the two Dualfuel units now in operation, Greenville is headed for new records in power plant profits. The Greenville plant was first described in the July, 1937 issue and again in the August, 1938 issue of DIESEL PROGRESS.

Principal Equipment

Engine—One 2800 hp., seven cylinder, 21½-in. x 29-in., 225 rpm., Dualfuel engine. Nordberg Mfg. Co.
 Generator—Westinghouse Electric & Mfg. Co.
 Gas Regulator—Emco.
 Gas meter—Metric-American Meter Co.
 Fuel filter—Wm. W. Nugent & Co.
 Lube oil—Vacine No. 3 in crankcase. Vacine No. 4 in cylinder. Magnolia.
 Cylinder lubricators—Manzel Inc.
 Lube oil purifier—Honan-Crane Corp.
 Lube oil cooler—Struthers-Wells Corp.
 Auxiliary lube pump—Blackmer.
 Cooling water pumps—Allis-Chalmers Mfg. Co.
 Cooling tower—Schubert-Christy.
 Water softener—Elgin.
 Air filters—American Air Filter Co.
 Exhaust silencers—Maxim Silencer Co.
 Pyrometer—Alnor. Illinois Testing Laboratories.

Latest Nordberg engine to be installed in the Greenville plant is this 2800 hp. Dualfuel unit. During the fiscal year ending April 9, 1950, this engine ran 8,329 hours, more than 95% of the time.



"CRUSADER"

**Completed by Puget Sound
Boatbuilding Corp. for San
Diego Syndicate**

By CHARLES F. A. MANN

JOING the southern tuna fleet in late June was the trim new tuna clipper *Crusader* completed at the Puget Sound Boat Building Corp. yard on City Waterway, Tacoma. *Crusader* is a husky Douglas fir and plywood vessel built like a proverbial battleship, and was designed by the yard's own architect, James J. Petrich. Principal dimensions are 105 ft. overall length; 25 ft. 6 in. beam and 15 ft. loaded draft. She carries 11 fish tanks below, including a novel combination fuel and fish tank (fuel outbound and frozen tuna inbound, after the tank is steamed out), as well as three refrigerated bait boxes on the main deck, also used as inbound frozen fish storage. Owners are John Cardoso and Associates of San Diego, and John Cardoso Jr. will be the skipper.

Main propulsion is supplied by a 600 hp. Enterprise diesel, turning a 66 x 43 in. Coolidge propeller. A 5" monel tailshaft and 5" forged intermediate shaft in the shaft alley-pump room connects the diesel with the propeller. Auxiliary power is supplied by three General Motors diesel sets. Two of them are 165 hp. units driving 65 kw. generators and one is a small 60 hp. unit driving a 35 kw. generator. Refrigeration is supplied by four 3½ x 3½ Baker ice machines installed by the Northwest Baker Ice Machine Co. of Seattle. All diesels are fresh water cooled, the main Enterprise by means of Wix heat exchanger supplied by the manufacturer and the General Motors units use Harrison heat exchangers built into the engine base.

Twin 10" Fairbanks-Morse bait pumps and 11, 2½" Fairbanks-Morse brine circulating pumps are fitted. Cargo winch is a Northern Line unit while the anchor winch is by Petrich. The yard installed and built the elaborate switchboard. All interior finish is in fine poplar and mahogany, and the elaborate galley carries walk in refrigerator, Lang oil range and tiled sink. A 16' Western Fairliner is carried atop the main deck, as well as an 18' skiff and 14' utility boat. She carries 25,000 gallons of fuel and 2400 gallons of water, a Photoelectric pilot and a radar set, with 3" Jacuzzi fire and condenser pumps, and 3½" Jacuzzi fire and bilge pumps, and Atlas compass. Elaborate quarters for a crew of 12 in addition to the master's stateroom on the top deck.

The main 600 hp. Enterprise diesel on the tuna clipper *Crusader*.



SPECTROSCOPE-DIESEL TROUBLE SHOOTER

By JAMES JOSEPH

MANY a diesel engineer and operator, suspecting trouble in their engines, have wondered: Will the spectroscope ever become a practical tool for preventive maintenance? That question can now be answered in the affirmative—with certain reservations. For several years now, while other industries toyed with spectrographic analysis as something better suited for lab work than for the field, a half dozen major U. S. railroads have taken the spectroscope out of the realm of pure science and have made it an instrument of practical, day-to-day preventive maintenance. At the same time, some of the major oil companies have come to the conclusion that a spectroscope can detect internal engine failures more readily than by most other instruments.

Southern Pacific railroad has, during the last two years, based much of its preventive maintenance upon quick, track-side spectrographic analysis. The railroad figures that it has saved an estimated \$260 per month on each of its road freight diesels and \$600 on each passenger diesel. And that its lab, which costs about \$2700 a month to run, has effected savings conservatively estimated at \$35,000 a month. Basically, spectrographic analysis as a trouble-shooter has to date been found most suc-

cessful in engine lube-oil examination. A lube oil spectrum, with its wavelength bands spread out in the spectroscope so that each element in the oil is calculable, is the key to trouble detection. Suppose that normal, new lube oil ordinarily contains four parts of lead per million parts of oil. Suppose, on the other hand, that the "lead" line of lube oil from an engine under observation indicates the presence of 100 parts to the million. Obviously, there's wearing somewhere in the engine—and enough to cause the high lead content. If only one engine component is made from lead, then lab technicians have little trouble putting their finger on the faulty part. But what happens when an element is discovered in abnormal amounts, yet could come from any one of several engine components? Here the detective work becomes tricky—but not impossible.

Southern Pacific's labs have been using the spectroscope on a day-to-day basis for almost a year and a half. Every 10,000 miles of a locomotive engine's life, a 100 gram sample of lube oil is taken. Some 200 samples are spectrographically examined every month in the Los Angeles lab alone. On the basis of these tests, run almost daily, Southern Pacific's technicians have come to these conclusions: (1)

That the spectrum of a lube oil sample can definitely predict trouble, and spot the failure before it causes a costly road breakdown. (2) To be effective, spectrographic tests must be conducted under controlled conditions. (3) The level of elements in each new batch of lube oil must be determined—by spectrography. (4) The chemical make-up of each engine part must be known. This is the most vital information for spotting faulty parts, based on spectrum elements found by lube oil analysis. (5) Each engine must be treated as an individual.

Thus, the lube oil of some engines normally contains more elements than another. Too much lead in one sample from a particular engine might be normal. Each engine, however, tends to seek its level of operation—which requires a fairly long and exhaustive record of periodic lube oil samplings—and what they contained.

Through day-to-day use, S.P.'s technicians have determined that some lube oil indications are clear-cut and definitely point out a faulty engine part; while others are less clear, and are oftentimes baffling. But they can be solved by further analysis of the oil's spectrum, and by auxiliary testing methods. For example, suppose that chromium is

Workman takes samples from locomotive's engines.

These samples, from lube engines, pour into the lab each month for spectrographic analysis.

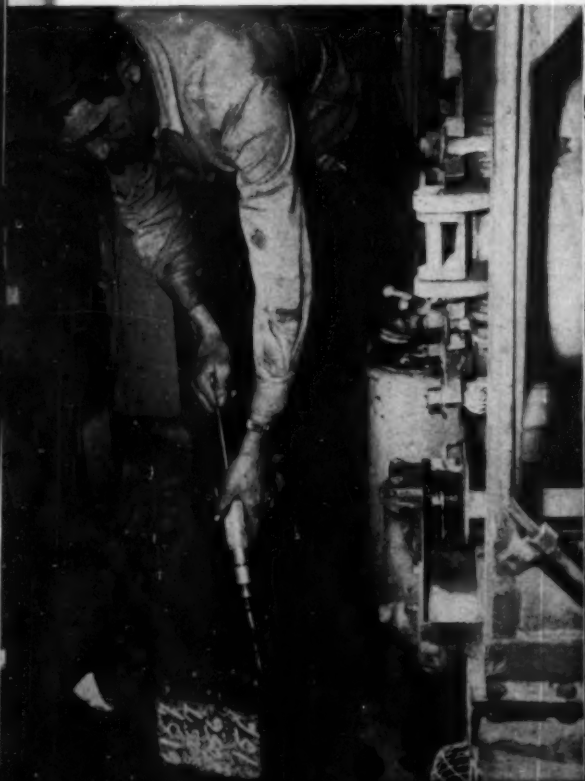


Table 1

Sample No.	1	2	3	4	5	6	7	8	9	10
(All parts per million-PPM)										
Lead	3.1	4.2	6.9	5.4	11.4	12.0	6.3	9.5	16.0	9.15
Silicon	3.0	2.0	6.2	30.0	11.9	13.9	8.3	7.3	4.1	13.8
Iron	9.6	11.1	16.6	18.9	47.5	40.0	22.6	13.9	20.2	16.5
Chromium	7.8	5.9	8.8	16.4	17.1	23.0	14.9	6.2	3.8	14.9
Aluminum	2.8	1.6	2.8	7.5	6.2	1.8	1.8	1.7	2.2	1.8
Copper	2.9	2.8	3.7	2.3	4.0	4.2	1.9	1.7	2.6	2.1

indicated by the spectrum of an engine's diesel lube oil. Normal lube oil, as used by S.P., contains no chromium. There are two engine troubles which could be responsible for the heavy chromium line on the spectrum. (1) Cylinder liner wear, because some cylinders are chromium-plated; (2) Engine cooling water leak, because the railroad adds a corrosion inhibitor, sodium chromate, to engine cooling water. Abnormal quantities of chromium in the lube oil could indicate either of the two faults. How to pin down the exact trouble before tearing the engine apart? Technicians merely scan the spectrum further. If there is no spectrum line indicating sodium, which would be present along with the chromium if a leak were involved, technicians are pretty sure that the trouble is in the cylinder liner.

Specifically, Southern Pacific is looking for abnormal indications of calcium, chromium, lead, tin, zinc, phosphate, silver and other elements, like iron and copper. Normal amount of silver in lube oil is about 6 parts of silver to a million of oil. When the silver content jumps to 30-60 parts, a trouble is indicated. In this case, the fault is high-temperature corrosion of the silver wrist pin bushings. Since no other engine part is made from silver, this is a positive indication.

Indication of abnormal quantities of lead in lube oil probably means lead flashings on main and connecting rod bearings are out, or wearing. This is an easy diagnosis, because no other part of the diesel engine is made from lead. A heavy indication of silicon is a give-away clue that the engine's air

filters aren't working properly because silicon dioxide or "quartz" is the abrasive element in dirt and sand. For a diesel engineer with a stationary engine, the silicon level would likely be constant, and a heavy silicon indication would point to air filter trouble. But the determination of harmful silicon content is more difficult for a railroad because over long runs an engine may pass through extremely dusty country. S.P. engines on desert runs show consistently high silicon spectrum lines—but these are considered "normal and standard" when the engine's run is taken into consideration.

Chief chemical engineer for the American Locomotive Co., A. C. Mengel recently discussed silicon findings at a symposium on spectrography held in Schenectady, New York. Ten samples of the lube oil from an Alco 9 x 10½ V type locomotive diesel were taken at 14-day intervals. (See Table I.)

Notice in sample four, the high silicon content. Chief chemist Mengel noted that when the spectroscope exposed the presence of silicon in abnormal quantities, it also showed something else: when silicon was high, indicating a faulty air filter, there was a parallel increase of iron and chromium, probably the result of the silicon's abrasive action on piston rings and chrome-plated liners. However, when the air filter was repaired, cleaned and serviced, these values gradually leveled off to normal. Meaning, of course, that the excessive wearage caused by silicon had decreased.

There are a few of the quick, positive findings. But what about abnormalities of elements in lube

oil, which while they indicate a fault, are unable to make a clear definition of the trouble? Copper, for instance, is one of these trouble-making elements. Says an S.P. lab man, "About copper we know a lot and we know nothing." High density of the copper line on the lube oil spectrum could mean any one of these faults (or a combination of them): (1) copper thrust washer in pistons—a serious trouble; (2) copper-lead bearing wear; (3) spacers wearing in the auxiliary gears; (4) or, simply copper dust from the main generators. Obviously, spectrographic analysis alone won't give a definite answer as to the fault. Southern Pacific's lab men either look further on the spectrum, hoping to find other indications, or they microscopically examine the lube oil sample to see if the copper content is in flake form or if it is chemically combined in the oil. Flakes indicate copper dust from main generators—a normal occurrence. When copper is chemically combined with lube oil, it indicates wearage.

On several occasions, Southern Pacific's spectrograph has indicated telltale elements which led to the finding of a faulty part. In almost a dozen cases the railroad has saved itself a road failure—which often costs anywhere from \$10,000 to \$20,000. In Southern Pacific's trackside lab, an analysis can be run on a lube oil sample in half an hour. Thus, the spectroscope has met the two requirements of a practical maintenance tool: (1) It is capable of quick detection. (2) It gives positive indications of internal engine troubles in some cases; gives good indications of troubles in others. There still remain many variables which must be taken into account. A manufacturer, for instance, can change the chemical content of a certain part. Or the lube oil content can be changed slightly. But once the spectrographic system has been set-up, it can work effectively as a trouble-shooter, on a day-to-day basis—as one diesel industry after another is proving.

Samples readied for spectrographic analysis.

Ash residue is loaded into spectrograph's electrodes.



THE LEVER DIESEL

By WILBUR W. YOUNG

HERE is a two-cycle diesel engine wherein the interposition of a second class lever between the piston and crank claims to produce (diagrammatically) 36% longer power stroke, 33 $\frac{1}{4}$ % longer compression stroke and 28.6% longer exhaust port opening than conventional engines of similar displacements.

The engine illustrated herewith is a test unit and is not claimed to represent the ultimate in compact design. It was developed to show the effect of the leverage hook-up on performance characteristics. It is essentially a uniflow, port scavenged, two-cycle engine with inlet valve in the head and a two-part connecting rod with the lever interposed between upper and lower parts of the connecting rod. The bore is 3 $\frac{1}{4}$ in., stroke 5 in., piston displacement 82.4 in., rated 21 hp. at 1200 rpm. continuous for two cylinders. The b.m.e.p., continuous is 84 and intermittent, 95; piston speed at 1200 rpm. is 1000 ft., compression ratio 16:1. The engine is fitted with Cleveland Graphite Bronze main and rod bearings, American-Bosch fuel injection pumps and injectors, Electric Auto-Lite starting and generating, John S. Barnes fuel and lube pumps, Pesco scavenging blower and Pierce-governor. Weight of the two-cylinder engine is 785 lbs.

Referring to the sectional view of the Model D2 the action of the leverage system is seen. Because

of the pronounced dwell of the piston at the bottom of the stroke, the ports have been made the exhaust outlet, with the valve in head serving only to admit scavenging air, at 3 to 5 psi. This makes for effective cooling of the valve, piston head and upper cylinder.

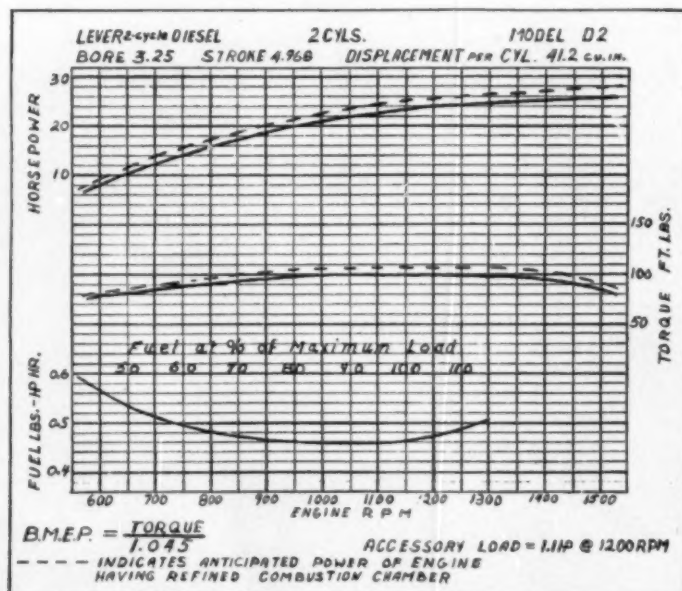
The maximum angularity of the piston rod is 3.3 degrees from the axis of the cylinder which minimizes the horizontal component of the piston thrust and resultant slap and wear. As the piston passes top center the upper pin in the connecting rod starts downward in an outward arc. This outward motion combines with the outward movement of the crank resulting in a more nearly vertical application of power and a more even distribution of pressure in the crank pin. Keep in mind that the piston stroke is 4.968 in., while the crank radius is only 1.656 in.

Now referring to the comparative port timing diagrams it appears that the Lever engine further enhances the inherent lugging ability of the diesel by providing a greater (longer) thrust or power follow-through. In a multiple cylinder engine of this type it is also seen that the power stroke actually overlaps 10 degrees on the engine crankshaft. The designers of this engine admittedly have concentrated on perfection of the leverage system leaving some development work to be done on

combustion chamber design but they report that at no time has the test unit exhibited characteristic ping or knock. Rather that the engine has delivered power, at all points under maximum, without laboring or signs of stress.

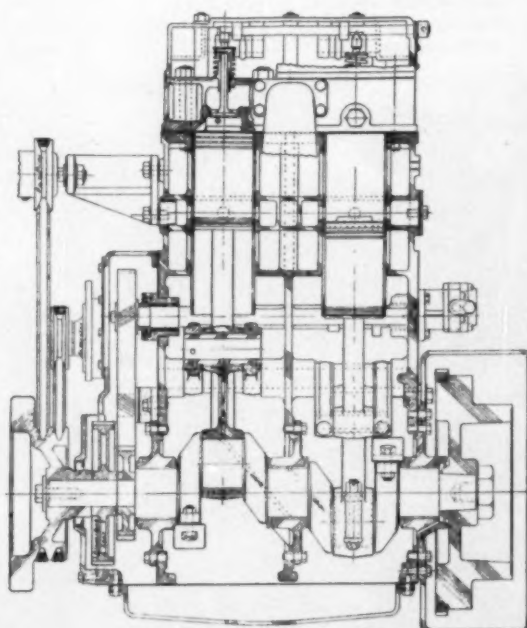
Considering the crank mechanism itself it is noted that the movement ratio of piston to crank is approximately 1:1. Thus at 1200 rpm. the piston travel is 1000 ft. while the crank pin travel is 1040 ft. The assembly in action is characterized by a simple wrist pin oscillation. The movement on the piston pin is negligible while pressure on the fulcrum pin is of low magnitude. Both the piston rod pin and the connecting rod pin, in a complete revolution of the crank, oscillate approximately 60 degrees each. The connecting rod pin bears a 50% greater load and is designed accordingly. Except for the fulcrum, these pins are pressure lubricated. The lever assembly including the piston can be removed through the side of the engine block. In the two-cylinder engine these units can be removed and replaced in 35 to 40 minutes.

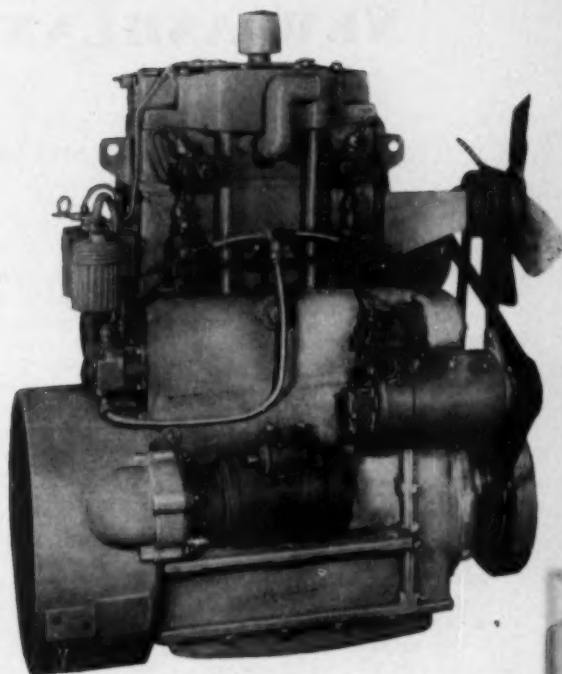
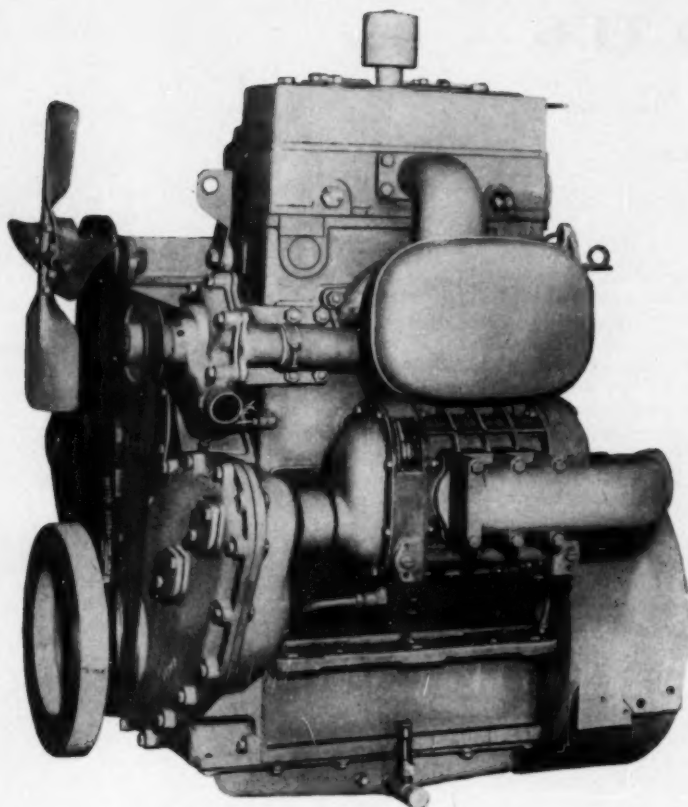
In its present state of development the Lever engine represents five years of design and research by Lever Motors Corporation of Charleston, Illinois. The company is now preparing to manufacture certain models and to offer licenses for the manufacture of other models.



POWER CURVES

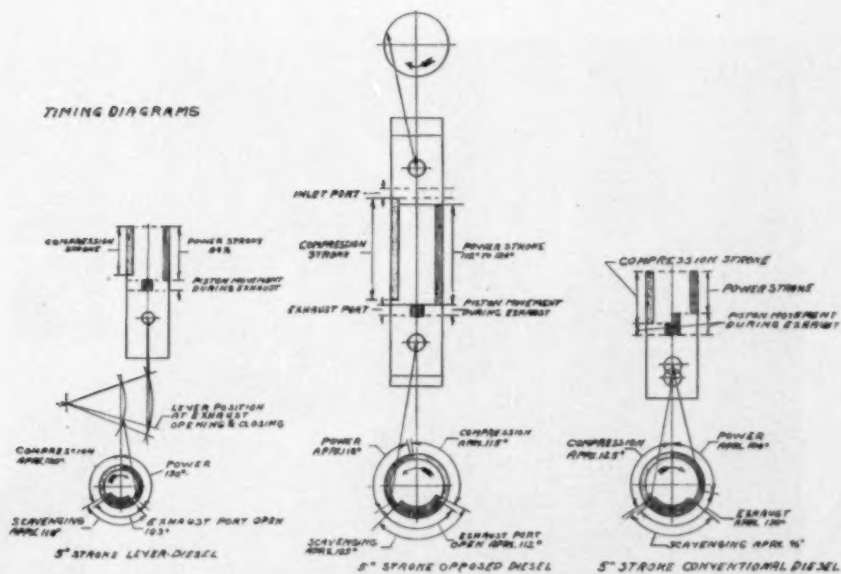
Transverse section of the model D2, two-cylinder Lever diesel.



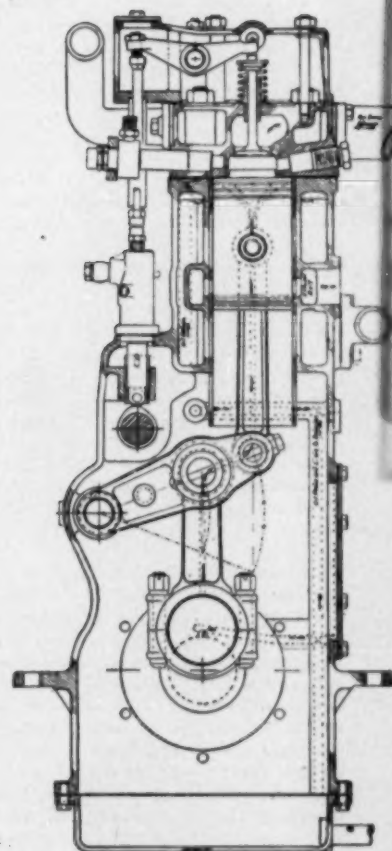


Intake side view showing Pesco scavenging blower and the pressure chamber.

TIMING DIAGRAMS



COMPARATIVE PORT TIMING DIAGRAMS



MODEL D2—CROSS SECTION

NEW ASHLAND TUG

By DOUGLAS SHEARING

THE *Aetna-Louisville*, christened in October at Chicago, is now plying the Mississippi and Ohio Rivers pushing barges, loaded with crude oil, from oil terminals in the vicinity of New Orleans to the 45,000 barrel per day refinery of the Ashland Oil & Refining Company near Ashland, Kentucky. The round trip of 3,274 miles requires 21 days.

After commissioning, a large crane later lifted off the pilothouse and other superstructure so the boat could pass under the bridges spanning the Chicago River and Drainage Canal. The superstructure was replaced when the boat reached Lockport, 31 miles from Chicago. This latest triple-screw addition to Ashland Oil's river fleet of eight towboats and ninety barges then passed down the Illinois River into the Mississippi ready to begin work as the most powerful boat on the rivers. The initial "tow" of the *Aetna-Louisville* consisted of fifteen semi-integrated, 10,000-barrel barges, but soon it will have its special tow of eight large, completely integrated barges having a combined capacity of 170,000 barrels of oil at 8½ feet draft and a maximum capacity of over 200,000 barrels when river conditions permit loading the barges to their maximum draft of 10½ feet.

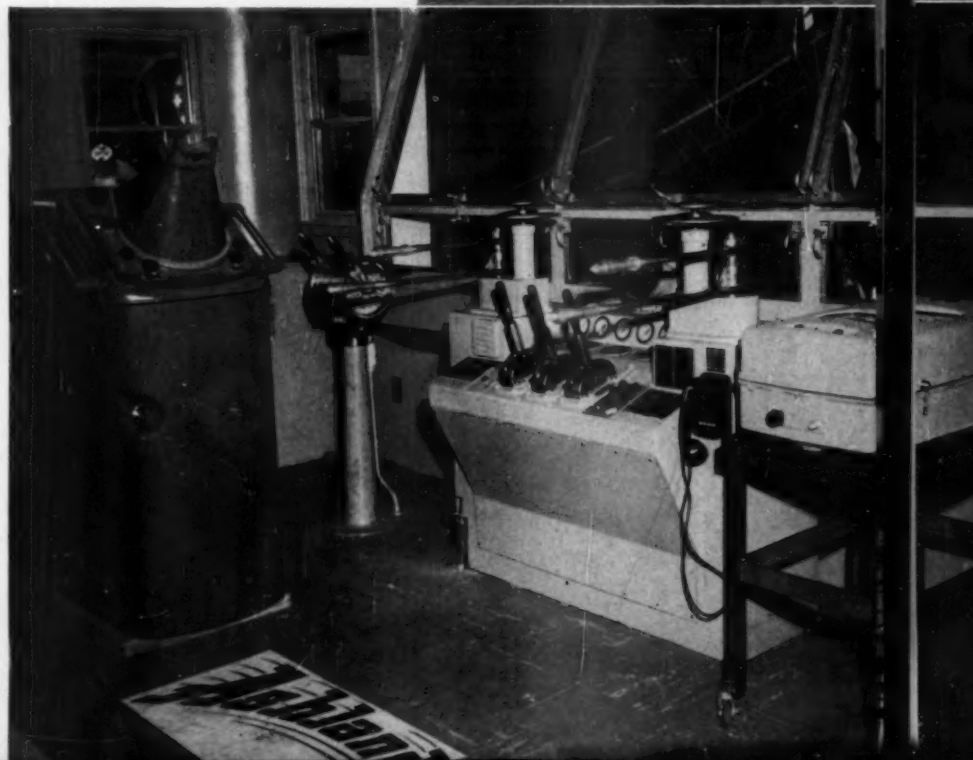
Fully loaded, the *Aetna-Louisville* and its tow moves at a stillwater speed of 9 miles per hour and when running "light" at a speed of 12 miles. With its eight barges fastened rigidly to the big towing knees of the boat and lashed together two abreast and four lengths long, the tow is 105 feet wide and 1,020 feet long. The boat itself is 50 feet wide and 150 feet long, making an over-all length for the boat and its barges of 1,170 feet, more than a fifth of a mile. To permit this long tow to negotiate the river turns—usually without reducing speed—the boat's nine rudders have more rudder power than the large ocean-going boats. Of the three steering rudders located directly behind Kort nozzles, the two on the outside are of contraguide design. There are six additional rudders used for flanking and backing.

The three 16 cylinder diesel engines of the *Aetna-Louisville*, each developing 1,600 hp. at 750 rpm., were built by the Cleveland Diesel Division of General Motors, and are all three equipped with Marquette governors. Utilizing reduction gears, these engines turn, at approximately 225 rpm., three propellers having a diameter of 8 feet and a pitch of 7 feet 3½ inches. For short periods the three engines can develop a total of 5,400 hp. at 800 rpm. Three Detroit GM diesel driven generators, each developing 100 kw., 440 volt, 3 phase, 60 cycle alternating current and 20 kw., 120 volt direct current, furnish electricity for all purposes.

Every effort has been made to provide comfortable

living quarters for the crew of sixteen men, who often are on the boat for long periods, although they receive one day's vacation with pay for each two days worked. The crew's quarters include accommodations for two trainees. Each of the three guest cabins has twin beds and private bath. Electricity is used for cooking, fast freezing of food and other refrigeration, laundry, air conditioning of living quarters, fluorescent lighting, the operation of equipment for the filtration and purification of water, television in crew's lounge, power capstans, supersonic recorder of river depth, automatic pilot, air compressors, pilothouse control of engines, pumps, searchlights, ship-to-shore radio telephone, amplified speaking system for pilothouse communication with crew-members who may be more than 1,000 feet away on the head of the tow, and radar which during fog enables the pilot to see the shore line, familiar land marks and river obstructions, and other boats, thereby permitting safe operation when otherwise it would be necessary to tie up awaiting better visibility.

The Calumet Shipyard & Dry Dock Company of South Chicago started construction of the *Aetna-Louisville* in November, 1950, and is building a sister-ship to be completed in the spring of 1952. Boats previously built by Calumet for Ashland Oil are the *Jim Martin*, in 1940; *Ashland*, 1941; *Paul Blazer*, 1941; and *Tri-State*, 1942.





The traditional bottle is broken over one of the forward deck capstans on the AETNA-LOUISVILLE at Chicago by Mrs. Walton T. Davis, of Louisville, whose husband is president of the Ashland Oil Company. Others in the foreground, left to right, are Edward Marshall, vice chairman of the Board of Ashland Oil, Mrs. Marshall, Board Chairman Paul G. Blawie of Ashland Oil and Mrs. Blawie; Walton T. Davis, president of Ashland Oil.



AIRLIFT FOR DIESELS

ELECTRIC power for Iron Ore Company of Canada's remote Burnt Creek camp, located at the rich new iron ore discoveries in the wasteland of northern Quebec and western Labrador, is being supplied by an International UD-24, 180 hp. diesel engine and an 85 kw. Ready Power generator set, part of the earliest cargo flown in by the "airlift," supplying the mine development. Since every bit of supplies, equipment and personnel must be air-ferried from Seven Islands, a 45-ton daily cargo is common, as the world's first civilian "airlift" of major proportions speeds exploitation of these new mines.

Two smaller generators are also on hand at Burnt Creek, an International UD-6 diesel engine and 20 kw. generator and a Caterpillar D-4600 diesel with a generator of similar capacity. These units will supply power for the welding machines to be installed in the camp's maintenance shops and to act as standby power. A large hydro-electric power development is now under way at Lake Menihik, 30 miles south of Burnt Creek camp. An earth fill dam will be built here at Menihik Rapids which will generate 30,000 hp. An airstrip is now being constructed here by several of the fifteen International TD-14A crawler tractors which were recently flown in. Like all the rest of these wilderness operations, Menihik dam construction work must be completely supplied by air.

Once the dam is completed, it will provide power for the mining operations and all other facilities in the Burnt Creek area. The generator sets will then become standby units.

Top, left: First step on the flight to the frozen north—truck backs carefully to door of "Flying Boxcar," International TD-14A tractor cases aboard under own power. The big plane is on loan from the U. S. Air Force "in the interests of national security."

Twenty-four hours after aircraft touches down at Knob Lake, International tractor and scraper, flown in on separate flights on same day, haul gravel fill for highways and roadbed of new railroad.

Electric lights in the far north are supplied to Burnt Creek camp by this International UD-24 diesel engine and 85 kw. generator set.

SYNCHRO-MASTER

THE mechanical differential has been used for over fifty years by the automobile industry for applying balanced driving power from the engine to the two rear wheels. The reason for its broad application in this field is that the differential mechanism has inherent in its design the basic factors for balancing speeds, thrusts, and displacements. It also performs the less commonly recognized function of measuring speed and distance as indicated by the speedometer and odometer. To do this, it automatically averages the rate of rotation and the number of revolutions of the two rear wheels. This familiar example serves to point out the basic ability of the differential exactly to measure sums and differences and to integrate these with respect to time.

Dynamic and variable mechanical functions are produced by gears, cranks, links, etc., and within a given machine they bear positive and predictable relationship to each other. Therefore, it is logical to utilize similar mechanical elements for the external coordination of such functions. The mechanical differential utilizes the inherent mathematical exactness of spur and bevel gearing and when properly applied it will accurately synchronize variable functions of many kinds. It provides moment to moment response and has the added ability to accumulate control errors and integrate them with respect to time.

The control force produced by the differential is positive and of equal magnitude throughout its range. As a direct mechanical synchronizer, it is used to control the speeds of internal combustion engines, turbines and steam engines and with suitable servo systems it regulates the flow of fluids and gases, phases electric generators, pumps and com-

pressors and blends lubricating oil, gasoline, chemicals, cosmetics, etc. By synchronizing against a constant known reference it becomes a precision governor of rotative speed, fluid flow, and industrial processes.

The Synchro-Master as developed by %Proportioners, Inc. when arranged as shown herewith, is known as the Differential Synchronizer, and is designed to synchronize internal combustion engines and other machines running at 500 rpm. and above. The speeds of machines A and B are carried to the differential by flexible shafts connected to the proper terminals of the bevel gear adaptors to produce opposite rotation of the side gears 1 and 2. The bevel pinion-spider assembly 3 is pinned to the center shaft which carries the sun pinion of the planetary reduction section. This section reduces the angular velocity of control lever 4 sufficiently to prevent over-controlling even though input speeds may be 2000 rpm. or more.

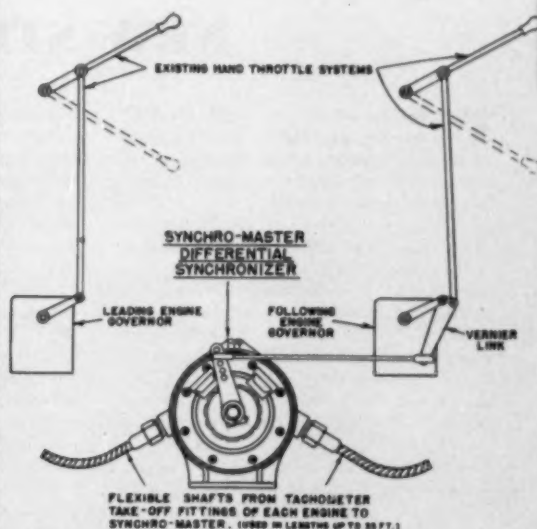
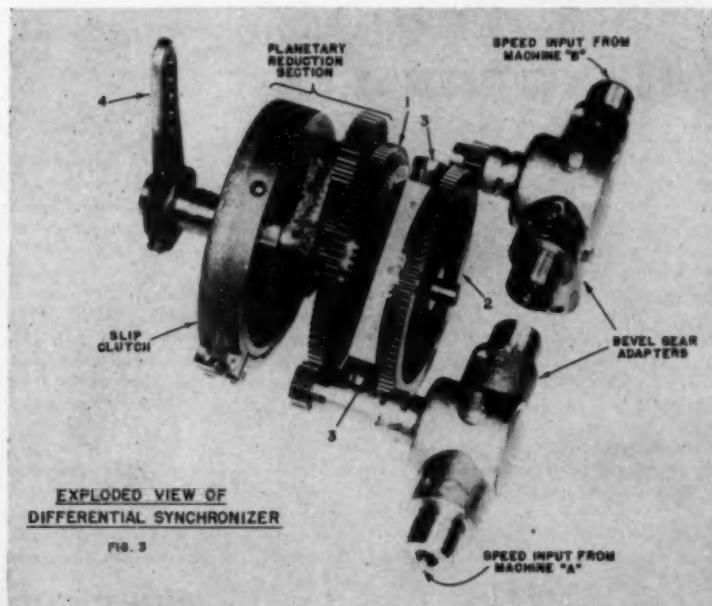
The slip clutch on the outside of the internal planetary gear is a safety device to avoid damage to the gearing if the control lever 4 is restrained. The internal gear provides means of disengagement since if it is allowed to rotate freely the planet arm and lever 4 will not move.

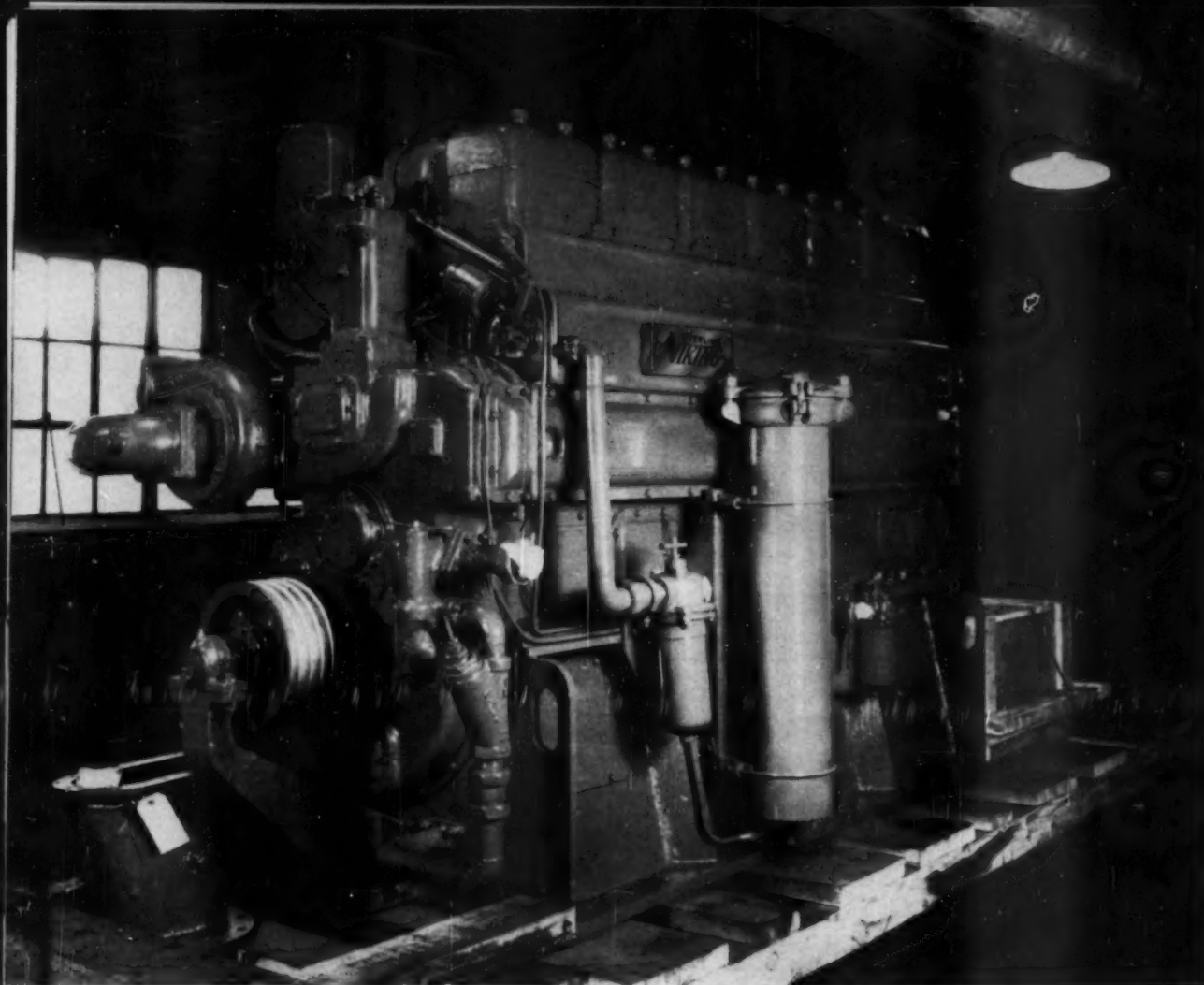
The most simple application of the differential is found in twin-engine boats where it is widely used to synchronize the speed of one engine against the other. The speed of the leading engine A is controlled by the usual hand throttle and the synchronizer controls the governor of the following engine B from idle to full throttle. Provision is made to return the following engine to manual control for starting, maneuvering, etc.

The Vernier Control is a refinement of the above control which is used on large diesel engines in towboats and locomotives where positive hand throttle control of both leading and following governors is required. The differential lever 8 is connected to the linkage of the following governor B through a relatively long link 5-4 and vernier link or bell crank 2-3-4. With the following hand throttle stationary, point 3 becomes a pivot and bell crank 2-3-4 will turn around it. Motion of lever 8 through link 5-4 will rotate the bell crank around pivot 3 and cause angular motion of governor lever 1-2. Stops 6 and 7 on the synchronizer case may be adjusted to limit the movement of the vernier linkage to a relatively small amount.

Therefore, when the following hand throttle is moved, the bell crank 2-3-4 cannot rotate appreciably and governor lever 1-2 is carried most of the way to its new position. In actual practice, the travel of the vernier linkage is adjusted to give it between 5 and 10 percent control over the travel of the governor lever. Thus, when the hand throttles are manually set within this percentage of each other, the synchronizer is effective. At settings farther apart than this, the synchronizer is off range and both hand throttles control normally. This system has the advantage of providing manual speed control of either engine at any time and automatic synchronization whenever the hand throttles are set for like speed.

On twin diesel electric locomotives, where both engine governors are controlled by one throttle lever, this system is particularly effective. It automatically compensates for linkage inaccuracies and wear and assures equal loading of the two engines at all times.





Sterling new 6-cylinder 400 kw. Viking diesel generator set on skids ready for shipment to a South Pacific destination.

NEW STERLING DIESELS

THE Sterling 400 kw. and the 600 kw. diesel generator sets are a modern method of meeting the critical shortage of both the materials and skilled labor that go into the manufacture of diesel engines and electric generators.

The Sterling Viking 1200 rpm. diesel engine used to power this unit is a rugged, heavy duty, high-speed, light weight engine originally developed by the United States Government to fulfill the need for just such a unit. Over 200 of these engines are now in use and have justified the Government's faith and expense. They are turning in records ranging from 93% to 96% availability per year since their installation on almost every railroad in our land and many in South America. The railroads have found that the maintenance costs are reasonable and they can be kept operating for a very large percentage of the time.

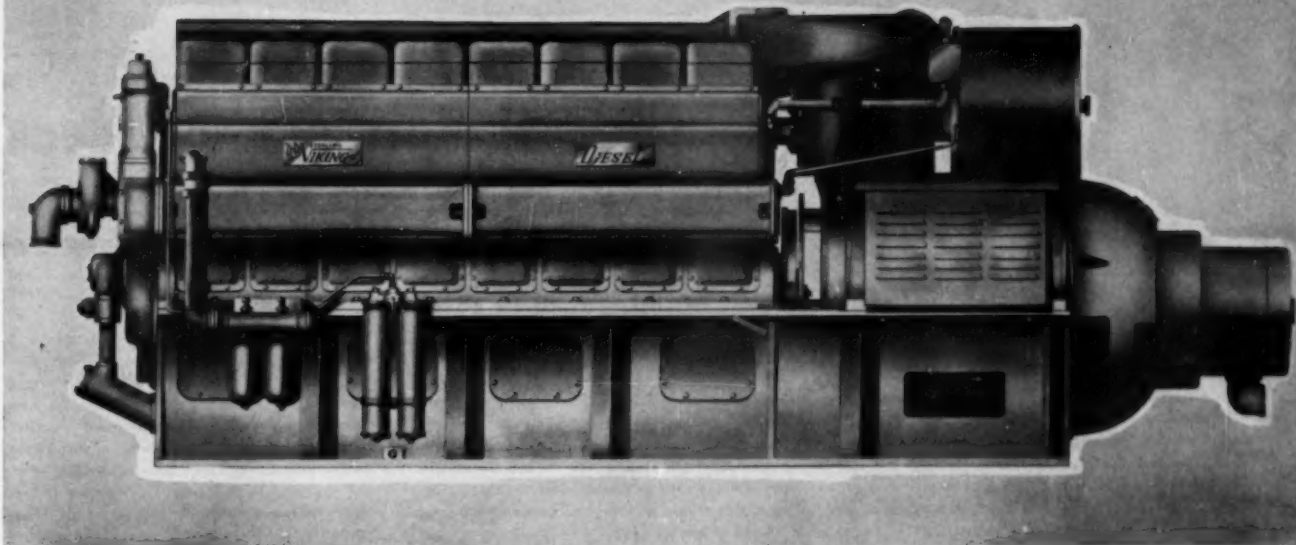
The engine was designed from the start to operate at 1200 rpm. and is definitely not just another speeded up overrated engine. The cylinder liners are completely water jacketed all the way to the top. The pistons are of special aluminum alloy and are oil cooled. From the very beginning there has never been any trace of piston scuffing or piston ring sticking in this engine. There are four large valves in the cylinder head, two inlet and two exhaust, and the passages through the cylinder head and headers are extremely large and streamlined, which permits this engine to breathe normally when operating at 1200 rpm. The maximum exhaust temperature when operating at full load is approximately 800 degrees, and the maximum fire peaks in the cylinders are below 1000 pounds per square inch.

Great care is used in the manufacture of this en-

gine. Each crankshaft is carefully balanced in a rotating balancing machine, and the reciprocating weights are held within close tolerances, which makes the operation at 1200 rpm. practically vibrationless.

Both the engine and the generator are mounted on a welded steel sub-base, which assures perfect alignment at all times between these units. This sub-base has a built-in lubricating oil reservoir and is of very rigid construction. With this unit there is no erection in the field. This work is taken care of at the factory.

Since all lubricating oil for this engine is contained in the welded steel sub-base, no sump tank or interconnecting piping is required. This design is not only less expensive, but it eliminates the possibilities of leakage in interconnecting piping and



Sterling Viking diesel model VDS-8S, eight-cylinder supercharged industrial engine.

sump tank remotely mounted from the engine. Small size of parts and their low cost have made the maintenance cost as low as the old time low-speed engine. The light weight and small size of the Sterling Viking unit make it possible to ship the entire unit completely assembled with generator, and in case of emergency, it can be carried complete on a 10-ton truck. The unit can be unloaded by handling with rollers and crowbars and does not require heavy cranes and other expensive machinery and personnel.

Simplicity is the keynote of the Sterling Viking diesel powered generator set. No stone has been left unturned to insure ease of handling and installation and ease of maintenance of the entire unit. For example, it is possible on the Sterling Viking engine to remove any one complete cylinder head, piston and connecting rod assembly by one man in 30 minutes. After the cylinder head and piston are

removed, a liner can be removed in less than 5 minutes additional time. With the same man, it is possible to install a new liner, new piston and rod assembly, and cylinder head complete in approximately 40 minutes. Each and every bearing of this engine is readily accessible through adequate hand-hole and inspection covers and can be removed or replaced in a very minimum of time. Injection pumps, injection nozzles, lubricating oil pumps, water pumps, and other accessories are easily removable. All parts are manufactured to precision standards and are readily replaceable.

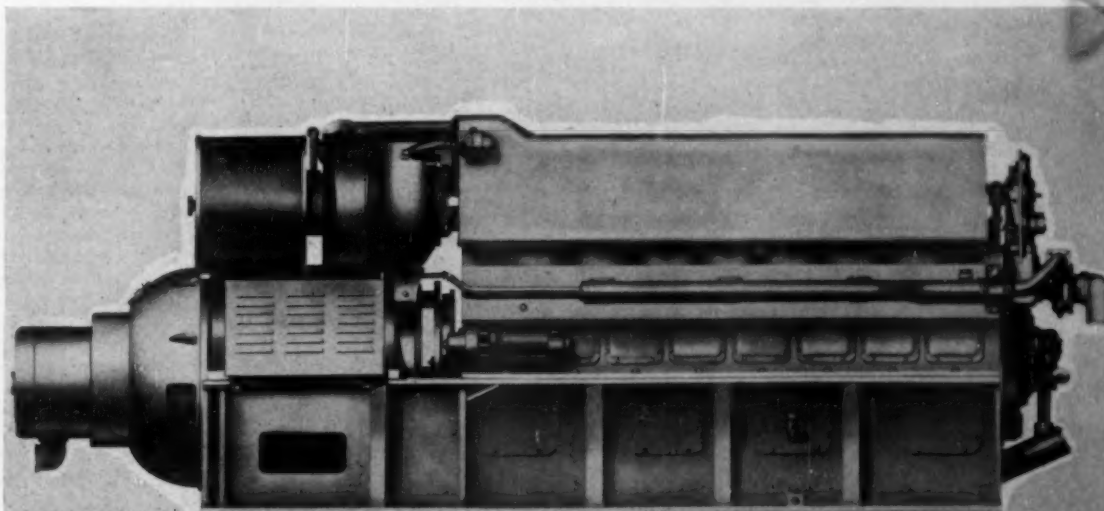
Sterling Viking diesel as made in both the six- and eight-cylinder unit, has bore of 8 inches and stroke of 9 inches. The 6-cylinder unit has 2714 cu. in. displacement and the 8-cylinder, 3619 cu. in. displacement. Both units are suitable for municipal power plants for either standby or continuous service. The type of cooling can be by any of the

conventional methods, such as radiator, evaporative cooling, cooling tower, heat exchanger, or recirculating system utilizing a minimum amount of make-up water from some outside source.

These units are also offered as package diesel electric power plants, each unit complete in itself, including housing for protection from weather. These package power plants may be operated in very cold or very warm climates. They do not require any special foundations and come complete, ready to run.

From a military viewpoint, the units can be dispersed over a considerable area and can be either manually or automatically connected in parallel to the power source. In case of bombing or destruction of one plant, the remaining plants can pick up the load, and spare units can be put into operation in the bombed area in a matter of hours.

The other side of the Sterling Viking diesel model VDS-8S, eight-cylinder supercharged industrial engine.



E

xchange Your Diesel Maintenance Ideas

CONDUCTED BY R. L. GREGORY

Preventive Electrical Maintenance in Diesel Plants—Part III

FOREWORD: The following is a continuation of the above subject, as presented by Mr. G. L. Oscarson, Chief Application Engineer of the Electric Machinery Mfg. Co., in a paper presented before the Iowa State College Diesel Power Plant Conference. This is the second part of Mr. Oscarson's paper and part III on the above general subject. We are indebted to Mr. S. P. Bordeau of the same company for this subject material. In presenting it to our readers it will be interspersed with comments by the writer.

ELECTRICAL AUXILIARIES: There are various electrical devices associated with rotating equipment in a diesel electric plant; for instance, motor starters, generator switchgear, transformers, etc. Possibly no one inspection system will suffice for all of these items.

1. *Motor control:* In diesel plants it is likely that most motor starters will be reasonably close to the motors they control, rather than located in a group in a load control center. These controls should be inspected during the quarterly motor inspection and checked off on the same inspection sheet as the motors.

Excessive heating would be evidenced by charring of coil insulation or discoloration of metal parts. This could be caused by a broken shading coil permitting chattering of the contactor armature, rust on the surface preventing accurate seating, or binding or distortion of the contactor assembly. Check for gummy bearings, dirt deposits or dripping liquids. Corrosion or worn mechanical parts may prevent proper closing.

Excessive worn contact fingers or springs which have lost their temper may result in poor contact or insufficient contact pressure, and subsequent heating. Contacts may be fairly rough without impairing their current carrying capacity, although any protruding tips should be replaced if half their volume has been worn or burned away. Close contactor manually, with circuit de-energized, to see that all contacts close and open together and that, in closed position, springs hold contacts firmly together. Check for excessive wear of mechanical parts. Check arc chutes and all shunts.

Go through starting, operating, and stopping cycle to see that arcing is not excessive. Oil immersed

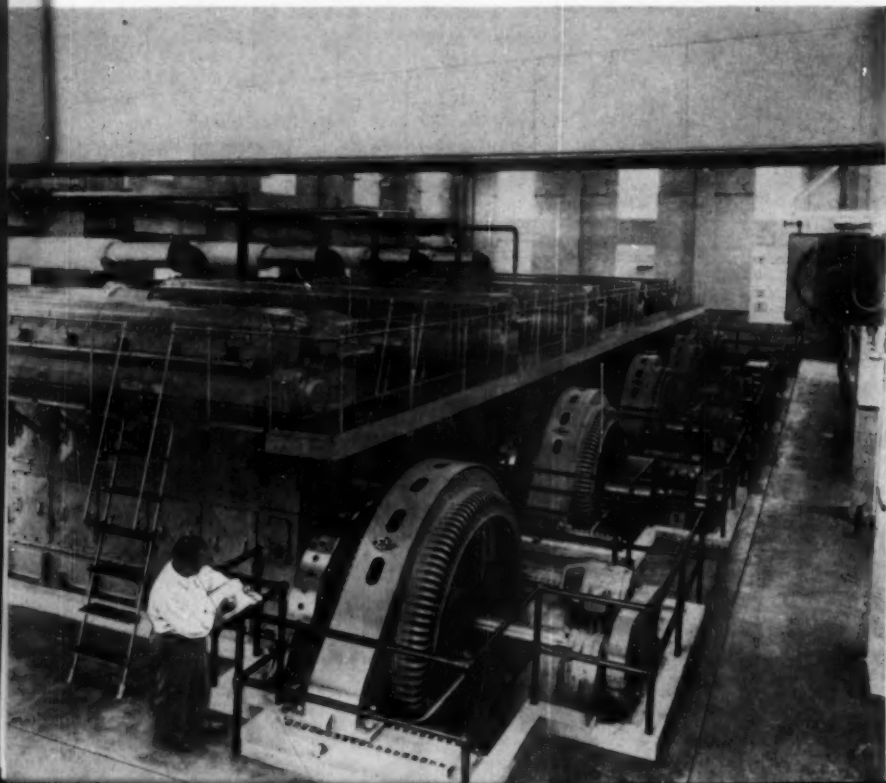
starting contactors should also be checked for oil level and for the formation of oil sludge. See that push buttons operate freely and that the overcurrent trip devices are mechanically operable. If ambient conditions of starters and the motors they protect differ widely during seasonal temperature changes, it may be necessary to change thermal elements regularly in order to protect the motors properly.

2. *Switchgear:* Most switchgear in diesel plants is equipped with oil circuit breakers. These breakers should be checked quarterly for oil level, sludge, and mechanical condition of trip devices.

3. *Annual Inspection:* All controls should be given a thorough inspection annually. In addition to the quarterly inspection, the line voltage and control voltage should be checked for one operating cycle. All overcurrent, undervoltage, and similar protective relays should be checked to see that they operate at the desired values. Check voltmeters, ammeters, and other instruments insofar as possible. Test dielectric strength of all oil in breakers, transformers, etc. Oil also should be tested after each operation of an oil circuit breaker on short circuit.

4. *Fire Protection:* Portable fire extinguishers of the carbon dioxide type are desirable from the standpoint of safety. If oil circuit breakers or transformers are installed in restricted areas, a permanent system, which may be automatically controlled, should be installed. This will insure safety of personnel as it may be unsafe to attempt to use portable extinguishers in some locations.

Writer's comment: With regard to fire protection facilities. During the past summer we have had some experience in the way of electrical fires, caused by lightning getting into certain oil switches and motors, even with the best and most efficient lightning arrestors available in use. Such fires are dangerous, not only to the equipment, but usually these breakers explode, with a resultant throwing of oil around the surrounding territory. Our plant is entirely equipped with carbon dioxide types of extinguishers conveniently located throughout. In addition to these we have several large dry powder type "Ansul" extinguishers available. We have found these dry type much more effective in all types of fires, not only from the standpoint of smothering gas, oil, and electric fires, but because their use does not produce fumes which in clouded or restricted areas sometimes result from the liquid type of extinguishers. This is vital to personnel handling the extinguishers, particularly when you are attempting to put out high voltage fires.



MAINTENANCE COSTS: A reasonably close determination of preventive maintenance costs is desirable. It is not practical to make out a time card for weekly or quarterly inspections. These inspections will normally be made by operating personnel and the time involved will be considered operating time. Annual or biennial inspections involve complete dismantling of motors and generators and time cards should be made out covering the entire time involved. Brushes, bearings, or other items required would be requisitioned from stock and proper charges allocated.

Writer's Comment: The writer cannot fully agree with Mr. Oscarson on the foregoing comment on maintenance costs. We feel that if maintenance costs are kept that they should be kept in their entirety. With the proper labor distribution, a perpetual inventory, and material issues from stock properly kept, it is a simple and accurate method of getting maintenance costs right down to the cent. While we do have the operating personnel responsible for weekly or quarterly inspections, we believe that actual operating labor should be kept distinct from maintenance labor and our labor distribution is set up on this basis. When it comes to the annual inspections and overhaul, specific job numbers are allotted to the work on each unit, all time and material being charged directly to that job number. In this way we are able to segregate the maintenance costs on each individual unit and make comparisons. Should we find that maintenance costs are excessive on any particular unit, we feel that there is a cause for the discrepancy and try

to either locate it or find the cause which will justify the variation.

MAINTENANCE PERSONNEL: In small operating plants, the operating personnel will naturally take care of weekly and quarterly inspection. For complete annual and biennial maintenance, it may be necessary to draw on local electrical shops, both for facilities and some personnel. For instance, most plants will not have available meggers for testing insulation resistance or equipment for testing the dielectric strength of insulating oils. A large organization, such as a power co-operative operating many plants, may maintain a separate maintenance force which would take care of all maintenance except weekly inspection.

Writer's Comment: The above is very true. However, there are certain situations which can be taken advantage of and will help out materially. In most instances, the Insurance inspectors carry meggers, voltmeters, ammeters, vibroscopes and other instruments for testing. They are always cooperative in helping check equipment. Again in communities which are not too far distant from each other, where diesel plants are operated, the Superintendents often cooperate with each other, and frequently go together and buy the more expensive instruments, each paying a partial bit of the cost and all having access to their use. In concluding his paper Mr. Oscarson went into some detail, part of which we will present here. However, space does not allow for a full discussion of all the basic information on characteristics of insulation, bearings,

commutation, etc. and since much of this has been discussed in previous articles we will conclude this article by just giving a few of his comments which we feel to be important to our readers.

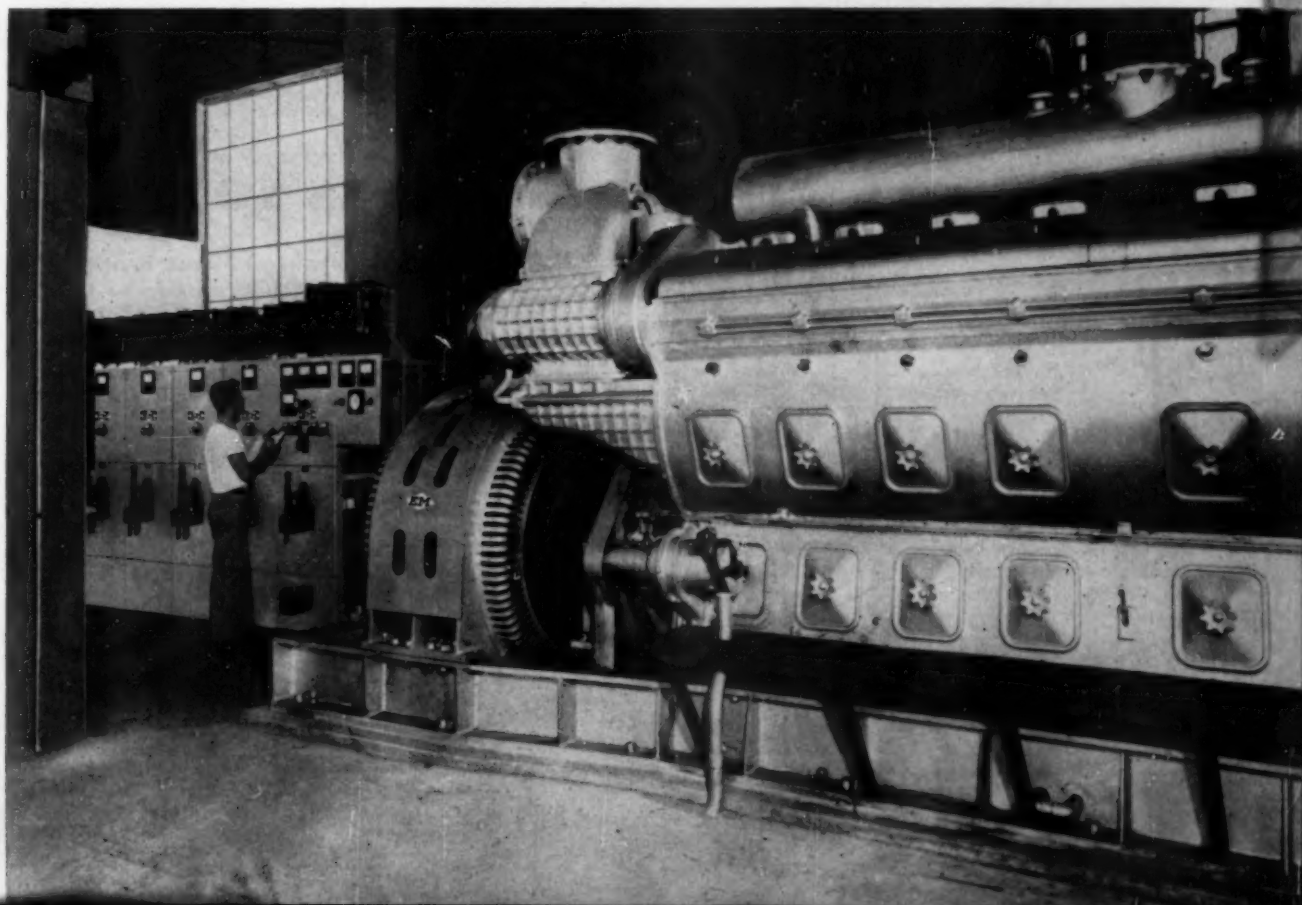
INSULATION. 1. Temperature: It is assumed that the temperature of the air surrounding a motor or generator is not over 40°C (104°F) and that the altitude does not exceed 3500 ft. The total temperature (i.e.) ambient temperature plus the temperature rise of the hottest spot in the machine is one of the important factors in insulation life.

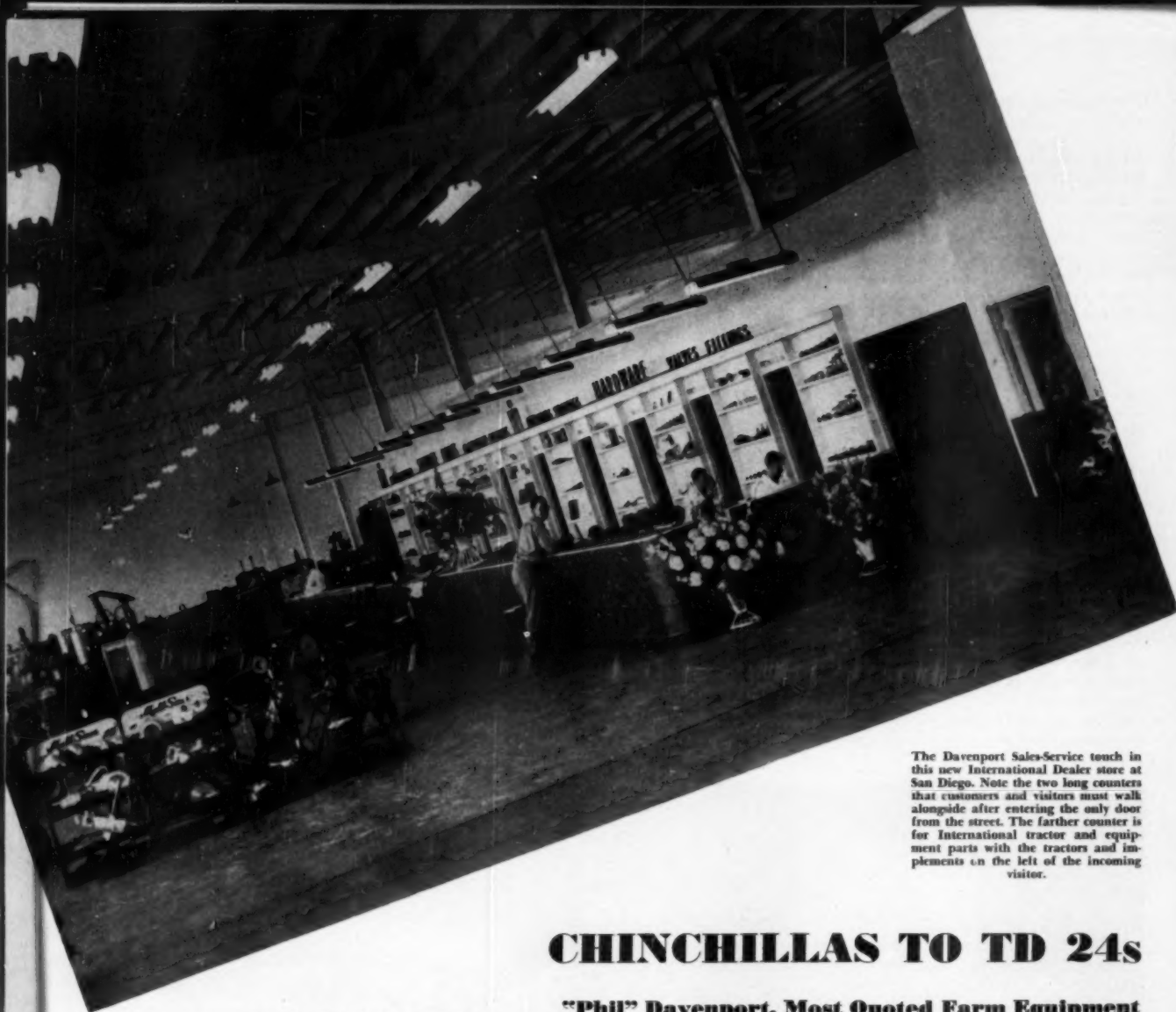
Class A insulation is commonly used. It may consist of cotton, silk, paper, or other organic materials impregnated with insulating varnish; cellulose filled bakelite, cellophane, or enamel as applied to conductors. This insulation is applied on the following basis:

Ambient temperature.....	40°C
Temperature rise by thermometer.....	40°C
Hot spot allowance.....	15°C
Service factor.....	10°C
Total temperature.....	105°C

Obviously, if the service factor is eliminated, as is commonly the case with AC generators, a temperature rise of 50°C by thermometer may be allowed. Where the temperature is determined by resistance or imbedded temperature detector, the rise may be 10°C higher than when measured by thermometer. An ambient of less than 40°C may be accompanied by a higher rise and vice versa.

... and now please turn to page 60 ...





The Davenport Sales-Service touch in this new International Dealer store at San Diego. Note the two long counters that customers and visitors must walk alongside after entering the only door from the street. The farther counter is for International tractor and equipment parts with the tractors and implements on the left of the incoming visitor.

CHINCHILLAS TO TD 24s

By F. HAL HIGGINS

"Phil" Davenport, Most Quoted Farm Equipment Dealer in the World, Cuts His Tractors to Fit All Farm and Industrial Jobs

"P H. DAVENPORT" is the plain economy-size title on the desk of the man behind the Southern Tractor & Equipment Co. in the open-door front office where "Phil" Davenport can be seen at his job of merchandising the International Harvester Co. lines in San Diego. Mr. Davenport has been an International dealer less than ten years, starting with the Red Line during the recent World War II after he got into the steel business here and found one morning that the Government didn't think he should have steel to sell to farmers and contractors while war and gambling equipment was so sorely needed by military men and political supporters of Ye Olde New Deal.

The modern building occupied by Mr. Davenport and his sales and service organization looks from the outside much like other modern standardized

pylon-style IH buildings over the U. S. map. Once inside, you immediately encounter the Davenport merchandizing touch. No extra doors swing into and out of the main showroom, Sales and Parts departments. Customer or visitor must take a long walk between a row of exhibits of various accessory lines handled by the same organization before reaching the counter to order parts for International machines. And when the visitor gets that far he is flanked by a line of International tractors and equipment on his left until he turns to the counter on the right to talk to a parts clerk. Then he faces a sales sample wall back of each desk showing important parts most needed at the time of year for International tractors and implements. These parts are hung to attract the eye, having light background to make them loom up and so spaced as not to lose their individual appeal and reminder to the caller who must see them while

waiting for an answer on his wants. A girl at the far end of the counter keeps an up-to-the-minute record of every part carried, so that the parts clerks know exactly what can be had at the moment they are asked. Both parts in front and machines behind the caller are changed with the seasons of the crops in the territory.

The name Davenport might make you think of a piece of furniture, but if there is any lying down done in this tractor territory it is by the competition. Actually, the Phil Davenport pedigree in the U. S. is older than the U. S. as a nation. There is a small island out in the Mississippi between what is now Iowa and Illinois, where Phil's original American granddaddy to the "X" generation started trading with the redskins before there were many whites around other than some of the French explorers who were looking the territory over via boat

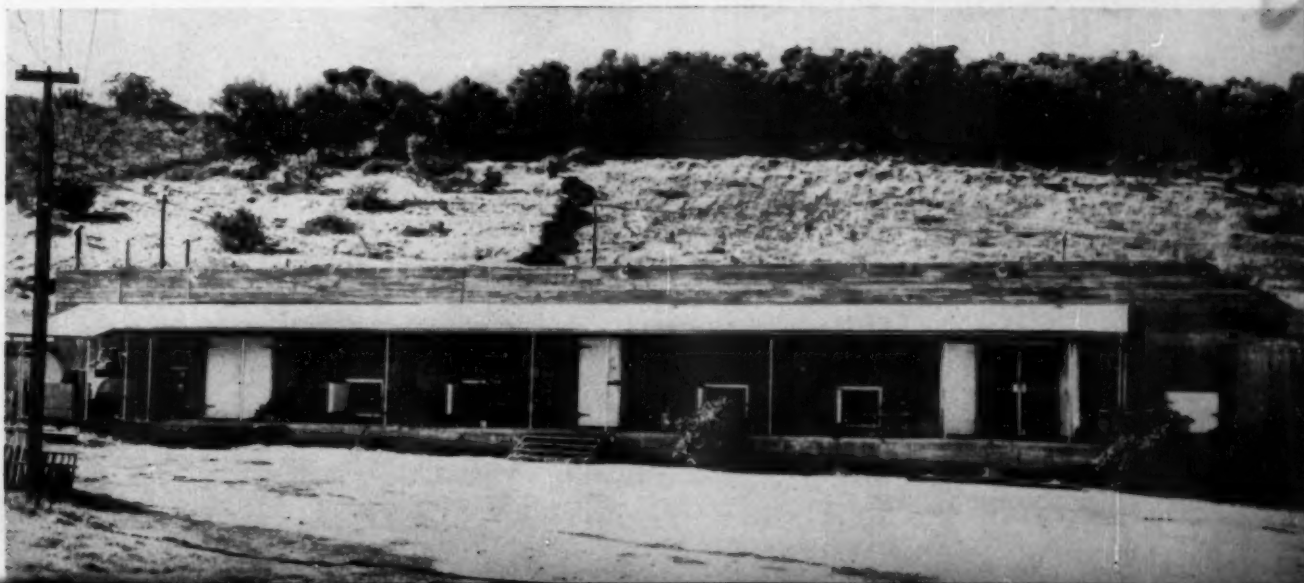
from Canadian treks over lakes and rivers. Pere Marquette, La Salle, Cadillac, Nicollet, are some of the names these early explorers left along their boat paths about the time that the first Davenport set up shop on his little island so located that he could do business and keep his scalp at the same time. There is a marker there today to let tourists know who and when.

But Davenport got his business training in the steel industry in this same area after he had been compelled to drop out of Pomona College to support his mother after his father's death. He had been taking law, and that training seems to have stood him in good stead in his later business years when he finally got going in his own business after working for others. He has as keen a mind as can be found in the industry at sizing up territory, his manufacturer-lines and the various jobs into which these machines will fit. He is not afraid to work over a machine to open up a new field that his competitors have overlooked. His cutting down of the smallest International tractor—the Cub—and sweeping the avocado farming area in spite of hills that stopped other wheel tractors is an example. The avocado is a big orchard item, the leader in the county for the whole U. S. and world, perhaps. It is a small grove, hilly-terrain farming system with overhead sprinkler irrigation instead of the old style flood irrigation.

The writer decided that it was time to call on this world-famous merchandiser to let the DIESEL PROGRESS folk get acquainted with the fellow who almost overnight became the hero of the entire national farm equipment dealer association when he made his talk before the annual convention at Chicago four or five years ago. His knowledge of their trials and problems and the humorous way of putting the trials of the dealer with Government and manufacturer brought down the house with continuous applause, belly-deep laughter and an ovation at the end. A year later, he addressed

New concrete and steel Chinchilla Plant owned and operated by Paradise Chinchilla Ranch, Lakeside, Calif., already houses over \$400,000 in chinchillas being bred and raised for fine fur markets. Southern Equipment & Supply Co., supplied steel for the plant.

Chinchillas? It's a Skin Game, but the gals like it, and it's now the fourth livestock crop in San Diego county with \$2,600,000 income last year and that's Big Business with little space required for operations. Here a model poses with a Chinchilla cape to display the beauty of this fur that is beginning to excite furriers because of the demands of the feminine buyers of fur coats, capes, and accessories. (Photo courtesy Paradise Chinchilla Ranch, San Diego, Calif.)



the newly organized California Farm Equipment Dealers' Association and not only won the crowd of allied and competitive dealers, but the publication of his speech by "Farm Implement News" of Chicago brought the greatest call for reprints of anything ever printed in its 69 years of publication.

Davenport believes in concentrating capital, brains and time on one thing at a time instead of dividing them and doing a poor or indifferent job on one or both. Hence, "Don't tie up your capital in a lot of expensive real estate. Rent the building and land from someone in the real estate business," said Davenport in his famous record reprint talk. Davenport has taken his own medicine. He rents and has his money free for use in financing his business, something that many a war-rich dealer has wished he had done after investing a quarter-million or more in a big building and expensive ground.

"Come out with me to see one of my big diesel-powered contractors at work letting out the stitches in our city that is busting its breeches in doubling population in a decade and is now starting to again re-double that as war orders put all the plane factories to work turning out bombers and war freight planes," invited Davenport. So, we drove out to a new suburb southeast of San Diego, several miles from the center of the city. Here we

glimpsed one of the big TD 24's of the trio on his job recently sold by Davenport's organization.

"This contractor with over a million dollars worth of equipment today started from nothing only a few years ago, explained the I. H. dealer. "But he knew his business, bought new diesels as fast as his bigger jobs came along and is now one of the two or three biggest dirt moving contractors in the San Diego area." We got out of the car and walked around to the contractor's office, passing a fleet of GM-powered Tournapull self-propelled carrier scrapers. "Now that there is a shortage of the big tractors, this contractor is buying any and every kind of diesel-powered equipment," explained the host as we passed a fleet of HD 19 and HD 14 Allis-Chalmers tractors powered by GM diesels.

In another spot were Caterpillar crawlers of the D8 size. By driving back of the big Navy radio towers and station, we came on the International TD 24 trio working at laying out pioneer roads along the bottoms of hills and bulldozing off the brush and filling low spots to carve the hilly terrain up for streets and home construction. Each TD 24 was equipped with Bucyrus-Erie bulldozer and a special push plate that protected the bulldozer and gave perfect contact for pushing and loading scraper needing more power. The tractor operators were

doing fast and Beautiful work with their three TD 24's, one of which wore an Isaacson attachment.

"This construction work is taking about 60% of my tractor business, and my steel business is about 60% of my entire business," summed up the San Diego dynamo as we turned from the construction job with its big industries to drive out to look at the chinchilla farming industry that has come up to a place equal to the orange crop in San Diego county farming. "Any industry that ranks that high for a \$2,400,000 annual income is worth watching. They buy steel from me now to build their concrete plants that are located on leveled ground that extend back into a hill for even temperature and moisture. It will take tractors to build more such plants such as this one we see housing \$400,000 in live chinchillas separated into family cages, for the fur industry is taking all these skins as fast as marketed. Expert ladies fur garment manufacturers judge at shows. Best skins are bought at premium prices as fast as harvested. As the shows develop the best strains based on highest priced skins, registrations in record books of the national association will put the emphasis on certain "families" that are producing the champions of the shows, just as has happened in breeds of beef, dairy, bacon, wool and mutton producing breeds of livestock."

"Phil" Davenport's San Diego "Trading Post" is a lot fancier than the one his earliest American "x"-generation Grandpap had on that island between the cities of Rock Island and Davenport where he traded with the Indians bright blankets and calicoes for beaver skins, long before there were any states or cities in that vicinity.



the exchanger mentioned most in engine equipment lists

List of Equipment

Engines—Three 2000 hp. 21 1/4 x 29, 225 rpm. five gas-burning diesel engines. *Nordberg Mfg. Co.*
 Lube Oil Filter—*Ross Heater & Mfg. Co., Inc.*
 Lube Oil Cooler—*Ross Heater & Mfg. Co., Inc.*
 Auxiliary Lube Pump—*Ross Heater & Mfg. Co., Inc.*
 Water Pump—*Ross Heater & Mfg. Co., Inc.*
 Heat Exchanger—*Ross Heater & Mfg. Co., Inc.*

List of Equipment

Engines—Two 2,000-hp. and two 1,600-hp. *Nordberg Mfg. Co.*
 Standby Diesel—Six-cylinder *Nordberg Mfg. Co.*
 Generators—Two 1,400-kw. and 1,125-kw. *Nordberg Mfg. Co.*
 Blowers—*Ross Heater & Mfg. Co., Inc.*
 Air Filters—*Nordberg Mfg. Co.*
 Oil Coolers—*Ross Heater & Mfg. Co., Inc.*
 Cylinder Lubricators—*Ross Heater & Mfg. Co., Inc.*
 Auxiliary Lube Pumps—*Ross Heater & Mfg. Co., Inc.*
 Fuel Filters—*Nordberg Mfg. Co.*
 Gas Regulators—*Nordberg Mfg. Co.*
 Cooling Water Pump—*Ross Heater & Mfg. Co., Inc.*
 Heat Exchangers—*Ross Heater & Mfg. Co., Inc.*
 Water Separator—*Nordberg Mfg. Co.*
 Exhaust Pyrometers—*Nordberg Mfg. Co.*
 Levelmeters—*Nordberg Mfg. Co.*

PRINCIPAL ENGINE ACCESSORIES

Compressor—*Ross Heater & Mfg. Co., Inc.*
 Lubricator—*Ross Heater & Mfg. Co., Inc.*
 Lube Oil Filter—*Ross Heater & Mfg. Co., Inc.*
 Lube Oil Cooler—*Ross Heater & Mfg. Co., Inc.*
 Lube Oil Pump—*Ross Heater & Mfg. Co., Inc.*
 Lube Oil Filter—*Ross Heater & Mfg. Co., Inc.*
 Lube Oil Filter—*Ross Heater & Mfg. Co., Inc.*
 Lube Oil Filter—*Ross Heater & Mfg. Co., Inc.*

Table of Principal Equipment

Engine—*Nordberg Mfg. Co.*
 Generator—*Nordberg Mfg. Co.*
 Lube Oil Filter—*Ross Heater & Mfg. Co., Inc.*
 Oil Cooler—*Ross Heater & Mfg. Co., Inc.*
 Lube Oil Pump—*Ross Heater & Mfg. Co., Inc.*
 Heat Exchanger—*Ross Heater & Mfg. Co., Inc.*
 Cooling Tower—*Ross Heater & Mfg. Co., Inc.*
 Fuel Oil Filter—*Ross Heater & Mfg. Co., Inc.*
 Fuel Oil Transfer Pump—*Ross Heater & Mfg. Co., Inc.*
 Fuel Oil Filter—*Ross Heater & Mfg. Co., Inc.*
 Fuel Injection Pump—*Ross Heater & Mfg. Co., Inc.*
 Gas—*Ross Heater & Mfg. Co., Inc.*

PRINCIPAL EQUIPMENT

Steam engine—*Ross Heater & Mfg. Co., Inc.*
 Lube oil filter—*Ross Heater & Mfg. Co., Inc.*
 Lube oil cooler—*Ross Heater & Mfg. Co., Inc.*
 Lube oil pump—*Ross Heater & Mfg. Co., Inc.*
 Lube oil filter—*Ross Heater & Mfg. Co., Inc.*
 Lube oil filter—*Ross Heater & Mfg. Co., Inc.*
 Lube oil filter—*Ross Heater & Mfg. Co., Inc.*

It can be about a municipal power plant, a pipeline or a truck; an oil refinery, a chemical plant or a ship—most any industrial magazine feature story on engine or compressor installations shows "Ross Exchangers" in the equipment list.

See for yourself. The next time you glance over a story on a Nordberg, Cooper-Bessemer, Fairbanks-Morse, Worthington, Ingersoll-Rand, Cummins, Caterpillar application, to name a few, turn to the equipment list. See how many times it reads "Oil Cooler: Ross Heater. Heat Exchanger: Ross Heater."

There's more than one reason, of course. But the most important is that engine builders have service reputations to protect. An exchanger, though relatively small in cost, must measure up in dependability, as must its manufacturer. That's principally why Ross has long been standard with the most and the biggest. An exchanger must be well suited, design-wise and cost-wise . . . two requirements that Ross fulfills with unique success through its industry-leading standardization and mass production.

THE FACTS ARE IN THIS LITERATURE — To be familiar with the Ross Exchangers that are mentioned so often, request Bulletin 2.1K1 for engines of larger hp ratings and Bulletin 1.1K1 for the smaller.



ROSS HEATER & MFG. CO., INC.

1425 West Avenue
 Buffalo 13, N. Y.
 In Canada, Horton Steel Works, Limited, Port Erie, Ont.

Serving home and industry
 AMERICAN STANDARD • AMERICAN BLOWER • CHURCH PUMPS • DETROIT LUBRICATOR • KEWANEE BOILER • ROSS HEATER • TONAWANDA IRON



WHAT'S GOING ON IN ENGLAND

CONDUCTED BY HAMISH FERGUSON

Hamish Ferguson was appointed Secretary to the Diesel Engine Users Association in London in 1944. Previously senior technical assistant to Diesel and Insurance Consultants, London, and for several years with English Electric Company in the designing and erection of large diesel generating plants. Mr. Ferguson continues to do independent consulting work.

A NEW SUPERCHARGER. Wade Engineering Ltd. have developed a variable compression, pressure-charger which combines the simplicity and reliability of the Roots type blower with the ability to work, single stage, at pressure ratios of 3:1. Indicated efficiencies of over 60 per cent are claimed. The maximum internal compression ratio can be varied in the design according to the requirements of any particular application.

The control of the internal compression ratio can be handled manually or automatically by a suitable pressure sensitive device in the manifolding. It is this control of the internal compression ratio that forms the advantage of the V-type, since it should operate with minimum h.p. absorption.

The principle of operation can be seen from the diagram. In Fig. 1 the air is shown flowing through the inlet port to the semi-circular space between the case and the fully balanced rotor. In Fig. 2 compression is taking place against the back of the mating rotor. The compressed air or gas is delivered through a port in the end casing. This port is covered by a timing plate as shown in Fig. 3. By advancing the timing plate, delivery will take place sooner, and by retarding, delivery is delayed thus permitting further compression. In this way the internal compression ratio is variable over a wide range. There is a similar outlet port for the upper rotor at the other end of the case and thus two compressions per revolution are obtained. If required, a four-phase version is available.



Wade Engineering are specialists in the manufacture of the smaller blowers suitable for automobile and aircraft engines and the progress of this larger version for diesels, now undergoing comprehensive testing under service conditions, will be watched with interest by the engine manufacturers. It is

anticipated that detailed performance data will be available in the near future.

—AND A TURBO-EXTRACTOR. At the other end of the scale, Wade Engineering have developed a turbo-extractor which should prove to be of particular interest to diesel manufacturers and users. It is, in effect, a rotary scavenger and at the same time it claims to act as an efficient silencer. The principle of operation is that the extractor, by virtue of the kinetic energy stored from the initial exhaust pulse, creates a depression which greatly improves the scavenging of residual gases and assists in drawing in the incoming charge—its effectiveness in this direction varying according to the valve overlap. It would appear particularly suited to 2-stroke engines and it is claimed that the equivalent of 1.5 to 2 p.s.i. boost on the induction side can be obtained. The extractor is not mechanically driven and it is therefore adaptable for installation on many existing engines.

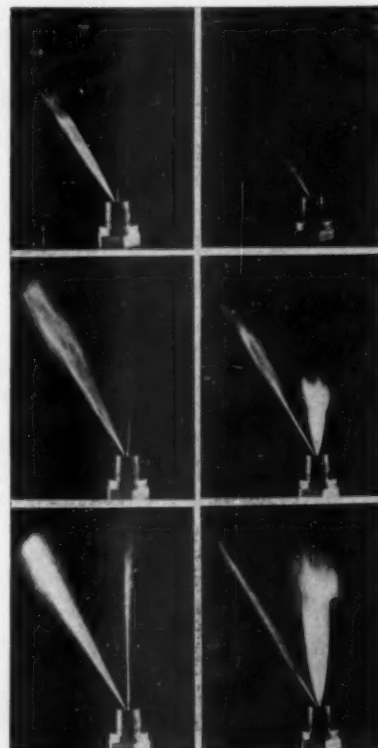
PILOT-INJECTION. After an exhaustive period of research and development, C.A.V. Ltd. are now in production with the C.A.V. — Ricardo "Pintaux" nozzle for use with Ricardo Comet type cylinder heads. This type of head is used on the A.E.C. 9.6 litre engine as used for the buses operated by London Transport. Specification of the engine is: — 6 cylinder, 120 m.m. bore x 142 m.m. stroke; direct injection combustion system; maximum output, 125 b.h.p. at 1,800 r.p.m.; maximum torque b.m.e.p. 110 p.s.i. With direct injection the engine is somewhat rough when operating at idling speeds but with the introduction of pilot-injection there is a marked reduction in combustion noise and a sound level equivalent to that of a petrol engine is achieved which is also noticeable during acceleration.

The Pintaux nozzle is a development of the pintle type nozzle used with Ricardo Comet combustion chambers and it is designed to improve starting characteristics without impairing normal running performance. The nozzle is basically the standard pintle type with an additional small plain orifice placed so as to direct a finely atomized spray of fuel into the hottest part of the air com-

pressed into the combustion chamber during starting. By selection of suitable clearance and overlap of the main pintle orifice it is possible to arrange for the majority of fuel to issue from the small auxiliary hole at low speeds (for starting), but to make the majority issue from the main pintle at normal running speeds. The series of high-speed photographs shows clearly the conditions of spray penetration at starting and during normal running.

Starting conditions, showing auxiliary fuel spray directed into hottest zone of chamber.

Running conditions, with both main jets predominating.



they never sleep



This pumping station is typical of scores of crude oil and oil products' pipe lines, where Alco Diesels are pumping over 6 million barrels daily.

You can depend on **ALCO DIESELS**

Experienced pumping station superintendents say they want engines that stay awake . . . and can be depended upon for long periods of operation with minimum maintenance. That's why so many of them prefer Alco Standardized Diesels. For example, 37 Alco engines rolled up 814,752 hours with only .02% hours unscheduled shutdowns, in one typical installation.

Pumping station superintendents like Alco Economy, too.

- Compactness means lower building costs.
- Higher engine efficiency means lower fuel costs.
- Flexible power range means easy expansion.
- Medium speed design cuts 1/3 the cost of principal auxiliary equipment.

Investigate Alco Standardized Diesels today and find out why in the last 10 years more of these engines have been installed in oil pipe line pumping service in the United States and Canada than any other make. Contact your nearest American Locomotive Company Sales Office at Beaumont, Chicago, Cleveland, Houston, Kansas City, New York, San Francisco, Schenectady or St. Louis.

ALCO DIESELS

THE ALCO ENGINEERING
AMERICAN LOCOMOTIVE COMPANY

Australian Built GM Diesel Locomotive

The first General Motors diesel locomotive built outside the North American continent was recently put into transcontinental passenger service in Australia. Officials of General Motors and its Electro-Motive Division at LaGrange, Illinois, participated in ceremonies at Port Pirie, South Australia marking the opening of the new service. The new locomotive, a special export type generally patterned after the F type so widely used in the United States in both freight and passenger service, was built by Electro-Motive's Australian affiliate, the Clyde Engineering Company, Pty. Ltd., at Clyde, N.S.W. Power plant, transmission equipment and controls were supplied by Electro-Motive from LaGrange.

The first GM diesel went into service on the crack train of the Commonwealth Railways on the Transcontinental Railway from Port Augusta to Kalbarri. The new engine cuts twenty hours off the previous three-day schedule required for the 1051 mile run. Until new passenger cars now on order are acquired, the top speed of the train is limited to seventy-five miles an hour.

Clyde Engineering Company has an order for ten more of the type of locomotives put into service. They will replace forty-seven steam locomotives on the Commonwealth Railways. This order will be followed by construction of twenty-six locomotives of a slightly different type for the Victorian Railways Department. Mr. B. A. Dollens, vice president

of General Motors and general manager of Electro-Motive Division at LaGrange, sent greetings to the Rt. Honorable Robert Menzies, prime minister of Australia and officials of the Clyde Engineering Company and railroad officials which were read as part of the ceremonies. Mr. Dollens sent a wood carving of the new locomotive to Mr. Menzies. The carving was executed by Lawrence E. Palenske of Park Ridge, Illinois and was mounted on a base made from one of the original timbers of the White House in Washington.



B. A. Dollens, vice president of General Motors and general manager of Electro-Motive Division, with wood carving of first GM diesel locomotive to go into service on the Australian continent.

The new Australian diesel has 1500 horsepower, is 61 feet long and 14 feet high, weighs 108 tons, has a maximum speed of 90 mph., maximum tractive effort of 50,000 pounds and axle load of 18 tons. The low axle loading permissible on the Australian tracks and bridges necessitated considerable redistribution of weight from the American design of the F type locomotive as well as the use of six wheel trucks instead of the American design of four wheel trucks. The Australian product is also distinguished by the fact that no train heating boilers are required anywhere on the continent. The space normally used for train heating equipment is used to house special engine room air filtering equipment made necessary by desert operating conditions. The engine also carries 1500 gallons of fuel oil, sufficient for its 1051 mile run.

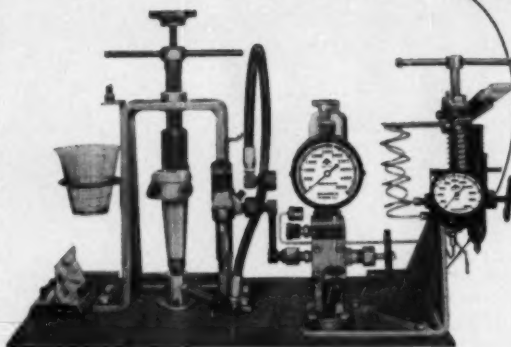
THE MOST COMPLETE LINE of Diesel Nozzle Testing Equipment EVER OFFERED!

For AUTOMOTIVE DIESELS

A completely self-contained, easy-to-use and compact test set for checking nozzles and injectors of all Diesels up to 60 hp per cylinder. The heart of this test set is the Bacharach Nozzle Test Pump located in the center. Nozzles made by American Bosch, Bendix, Caterpillar, International Harvester, etc. are attached directly to test pump by means of steel tube and union nuts. Cummins injectors are held in test fixture at left; GM 71 injectors in test fixture at right. These fixtures have individual fuel pressure lines which may be interchangeably connected to test pump.

Test Set includes Connector Set 44 comprising connector tube, Ermeto adapter and fuel inlet connecting nuts for all American Bosch R, S and T size nozzles and similar size nozzles of other makes.

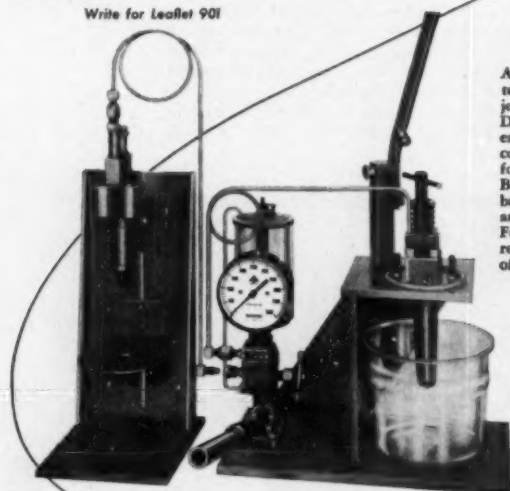
Write for Leaflet 901



For HEAVY DUTY DIESELS

An exceptionally versatile and convenient test set for checking nozzles and unit injectors of medium and large bore and stroke Diesel engines for marine, railroad and general industrial applications. Test set comes complete with fuel inlet connection fittings for American Bosch T, U and V size nozzles, Bendix-Scintilla C and D size nozzles, Fairbanks, Morse nozzles for 38D8-1/4 engines, and Electro-Motive 567 and 278A injectors. Fuel inlet connections to suit other specific requirements furnished promptly on receipt of specifications.

Write for Bulletin 634



This equipment is available in the two complete test sets illustrated, or may be purchased selectively in group assemblies for testing a particular type or related group of nozzles or injectors.

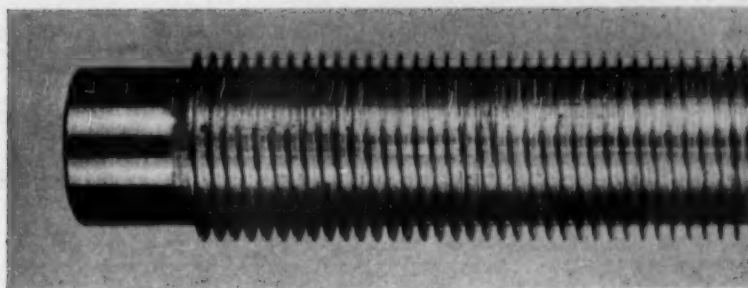
BACHARACH INDUSTRIAL INSTRUMENT COMPANY
7000 BENNETT STREET • PITTSBURGH 8, PA.

Distributor Appointed

Alvin Hall Machinery Company has been appointed distributor in southwest Texas and southern New Mexico according to an announcement made by J. J. Valentine, assistant director of sales for Caterpillar Tractor Company. The new firm will occupy the facilities formerly used by Tri-State Equipment Company with headquarters at El Paso, Texas. Alvin G. Hall, until recently president of Pioneer Contracting Company of Dyersburg and Memphis, Tenn., is president of the new distributorship. C. E. Jones, who is associated with Caterpillar as parts planning and developing manager and manager for the sales development division since 1946, will be general manager of Alvin Hall Machinery Company.



Why the LK-FIN Exchanger *is more effective...more compact...more economical* for lube oil and jacket water cooling



When cooling apparatus was first applied to Diesel engine lube oil and jacket water more than 50 years ago, the coolers were of the traditional type . . . a bundle of conventional bare tubes within a shell. That was the only kind of cooler known in those days.

But since then, many major improvements have been made in heat transfer apparatus. One of the most important of these developments has been FINNED heat transfer surface . . . that is, tubes with fins attached to the outside. These fins greatly increase the external heat transfer surface, thereby permitting a considerably shorter tube to perform the same cooling effect that requires a much longer bare tube.

Griscom-Russell has pioneered in the development of finned type heat transfer equipment for almost 20 years. Now Diesel engine users can have

the benefit of this development as applied to lube oil and jacket water coolers.

The result . . . more effective heat transfer because of the finned tubes . . . a more compact cooler because of the more effective heat transfer surface . . . a more economical unit because of the shorter tubes and shell.

The LK-FIN Cooler has many additional advantages, too. The tubes are free to expand and contract. An outside packed gland at the floating end permits detection and elimination of leakage. Tube interiors are readily accessible at the stationary end without disconnecting piping. The coolers are built as stock units.

Complete description, specifications and prices will be sent without obligation.

THE GRISCOM-RUSSELL CO., Massillon, Ohio

GRISCOM-RUSSELL



Maintenance

... continued from page 51 ...

Where high, ambient temperatures prevail, Class B insulation, consisting of mica, asbestos, fiber glass, or other inorganic materials, should be used. An observable temperature of 110°C by thermometer is permissible on Class B machines.

A minimum life of 60,000 hours may be assumed for effective life of Class A insulation operating at 105°C total temperature. This life will be approximately halved for each 10 degree C rise above that point, or doubled for each 10 degree C which the total temperature is lowered.

2. Care: Brittleness, cracking, or peeling is evidence that insulation has been damaged by heat. Load

shocks, causing coil distortion, may aggravate the cracking and permit dirt and moisture to penetrate, with breakdown soon inevitable. A thorough cleaning every two years, then a dip in insulating varnish followed by either a bake or a sprayed-on coat of air-dry varnish will do much to seal incipient cracks and preserve "life" in the insulation.

The presence of dirt, frequently in combination with water, oil, grease or chemical vapor, is another important factor in insulation life. Insulation life is frequently tied in with heating, due to coating of windings, thus reducing heat dissipation, to clogging air passages, and to restricting the flow of ventilating air. A look into any motor repair shop usually will show several stators with burned out

coils and oily, greasy, dirty, gummy, and sticky coils and cores.

Writer's Comments: The old idea of 40 and 50 degree rise C above room temperature is still a good criterion to follow, even though development of newer types of insulation and insulating compounds have been developed and are now widely used, there is no need of operating units at higher temperatures than necessary just because the insulation will stand it. A lot of life can be added to insulation by proper cleaning of units, by maintaining clean generating and motor equipment so that heat may be properly dissipated, and fresh clean air supplied for ventilation. When starting this article, it was the writer's plan to cover this paper in two issues, but due to the fact that Mr. Oscarson included many other features in this paper, we now feel that the discussion should be presented in its entirety and the subject will be continued in the next issue. The two photographs shown, depict operators and maintenance personnel, checking instruments and controls along the lines previously mentioned in this discussion.

ENGINEERING REPORT

INSTALLATION DETAIL ALNOR PYROTAC

Multi-circuit Pyrotac and Motor-Driven Switch continuously monitor exhaust temperatures. Wiring option—sound alarm, shut down engine or both.

(Right) 6-position switch ideally suited for reading generator field temperatures. Scale can be read from 20 feet. Can be used with either Pyrotac or existing pyrometer system.

(Below) Pyrotac—up to 13 circuits—gives combined exhaust reading on multiple engine installation for overload protection. Switch pointer will stop at number of offending engine... locating source of trouble on shut-down.

Gives constant check on bearing temperatures. Switch cycle can be interrupted to take close reading of individual bearing. All circuits are non-electronic—need no "tuning."

(Below) Thermocouple detail on bearing temperature installation. Alnor carries complete line of couplers and wire. Pyrotac without switch can shut down when maximum safe temperature is reached.

Summary: The Pyrotac and Motor-Driven Switch present many opportunities for improved instrumentation in the Diesel and gas-engine field. They can be used singly or combined to warn of excessive temperatures in cylinders, entire engines, over-heated bearings, burn-out danger in fields of large generators, etc. Such constant, automatic protection reduces maintenance time and expense to a minimum—increases efficiency and operating economy.

ILLINOIS TESTING LABORATORIES, INC.
Room 529, 420 N. La Salle Street, Chicago 10, Ill.

Ask your Alnor representative for assistance in solving your pyrometric problems today!

Alnor
PRECISION INSTRUMENTS FOR EVERY INDUSTRY

Giants Doing a Big Job



A giant shovel loads a giant truck in Shen-Penn Production Company's big strip mining pit near Wadesville, Pennsylvania. The shovel shown dropping a big bite is a Bucyrus-Erie Model 170-B while the truck is one of the company's fleet of giant Euclids. The truck, rated at 34 tons, is powered by two 190 hp. General Motors diesels driving through GM torque converters to Allison Hydraulic transmissions.

Takes Over Fleetways, Inc.

New through trailer service between San Francisco, Oakland and Los Angeles. . . and Kansas City, Omaha and Chicago, is now offered by Navajo Freight Lines following Interstate Commerce Commission approval of Navajo's application to take over the full management, control and operation of Fleetways, Inc., large midwest trucking concern. Acquisition of Fleetways extends the 3,000 mile trail of the "Blue-Eyed Indian" an additional 2,000 miles to the three gateway cities of the midwest, — Omaha, Kansas City and Chicago. Navajo's fleet of blue and silver trucks also serves other western key cities including Albuquerque, Denver and Amarillo. The Atomic Energy Commission installation at Los Alamos is also served by Navajo. Addition of Fleetways equipment will bring Navajo's rolling stock to a total of 682 units worth in excess of \$2,500,000.

Aeroquip

**FLEXIBLE HOSE LINES
CUT COSTS**



The "Aeroquip Idea" saves time, saves money, reduces inventory. To make your own Hose Lines, simply cut bulk hose to the required length and attach an Aeroquip reusable fitting.

AEROQUIP CORPORATION

JACKSON, MICHIGAN

FLEXIBLE HOSE LINES • DETACHABLE, REUSABLE FITTINGS • SELF-SEALING COUPLINGS • BREAKAWAY COUPLINGS • HYDRAULICSCOPE
AEROQUIP PRODUCTS ARE FULLY PROTECTED BY PATENTS IN U.S.A. AND ABROAD

ATLANTIC METAL HOSE

GUARDS

DIESEL LIFELINES

AIR • FUEL • WATER • EXHAUST

ATLANTIC flexible metal hose does a better job of controlling vibration of these vital lines and insuring their continuous trouble-free operation because each section is *Job Tested and Guaranteed to Do Its Job!*

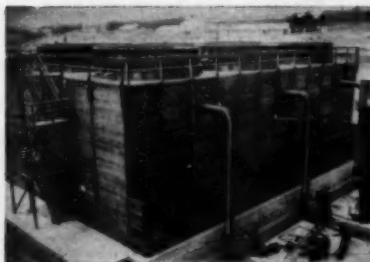
Flexible, strong, long-life hose guards meet your requirements. **"Order from Atlantic for Every Diesel Need!"** Furnished in all workable metals — 1/2" - 36" I.D. inclusive — with fittings as desired.

Write for Brochure, Bulletin 11-35 and 104 • See our distributor in Eastern City for Atlantic Hose Guards

ATLANTIC

METAL HOSE CO., INC.

102 W. 64th St. / N.Y. 23, N. Y.



Regardless of Altitude or Engineering Problems...

Pritchard Quality COOLING TOWERS

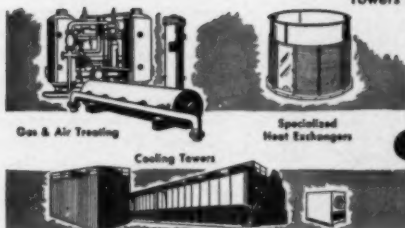
Meet Exacting Specifications

Tough cooling jobs are easily and efficiently handled by Pritchard Quality Cooling Towers. Take this Mexico City installation.

Jacket water from 6 heavy-duty diesels gets a cool-down from 110° to 90° F. at the rate of 12,960 GPM...and at more than 7,000 feet above sea level! Like every Pritchard Quality Cooling Tower, this unit was built and guaranteed to deliver rated performance with output to spare in emergencies. Why don't you, too, find out about the advantages of using Pritchard Quality Cooling

Towers to handle your water cooling problems? Consult your nearby Pritchard representative for full information.

Request free illustrated bulletin today.



J.F. Pritchard & Co.

EQUIPMENT DIVISION

Dept. No. 207

908 Grand Ave., Kansas City 6, Mo.

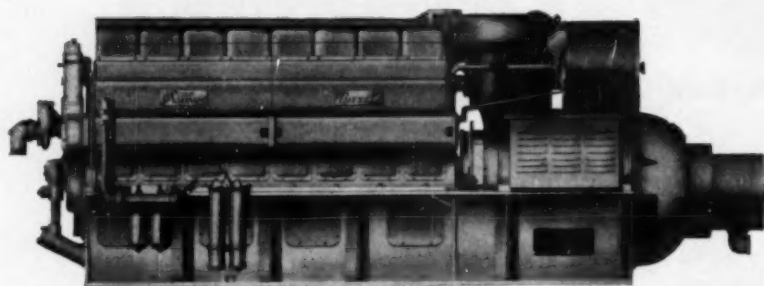
MAKERS OF
QUALITY
STEEL-FRAME
EQUIPMENT

Farr Company — DEMA Educational Meeting

Last month witnessed two DEMA educational meetings in California. The southern California meeting took place at the Farr Company plant in El Segundo (Los Angeles), November 8. The morning session covered the subjects of "Research and Engineering Plans" by R. S. Farr, president, Farr Company; "Air Filters for Diesel Engines" by R. B. Esselman, chief engineer, Farr Company; and a general discussion led by J. H. Caldwell, service engineer, The Cooper-Bessemer Corporation. The morning session concluded with a talk by Rex W. Wadman, editor and publisher, DIESEL PROGRESS, on "Engineering Challenges in the Diesel

Engine Industry." The afternoon session opened with an educators panel which covered the various aspects of the relationship of schools to the diesel industry. It was led by Prof. W. E. Mason of the University of California and participated in by representatives from California Institute of Technology, California State Polytechnic College, Long Beach City College and University of Southern California. The meeting ended with another panel discussion on "Preventive Maintenance" with J. H. Caldwell, service engineer of Cooper-Bessemer acting as leader. Participants included Vernon W. Balzer, Hallet Manufacturing Company; J. A. Flynn, National Supply Company; E. W. Hammond, Worthington Pump & Machinery Corporation; and H. C. Heil, Fairbanks, Morse & Company.

Sterling Viking Diesels definitely lower costs of power production



Model VDS-8S, 600 KW Generator Set. Viking Diesel "packaged unit" generator sets are available in 6 and 8 cylinder models. Bulletins 1024 and 1028 contain sectional views, fuel consumption curves, engineering and installation details. Sent on request.



We have the evidenced facts to show any user of diesel electric generator sets that the newly engineered Sterling Vikings can cut KW hour production costs as much as 50 per cent.

Fuel consumption, engine weight, compactness, housing, installation, parts cost, general maintenance—all are factors in the service

worth of a generator set. On every point Vikings offer proven advantages confirmed by comparison. In diesel engineering, Sterling has come up with design developments that have the industry talking. We would like to give you this story of lower power costs first hand. Write us for latest Sterling Viking Diesel literature.

Sterling

MARINE AND INDUSTRIAL
ENGINES



Diesel, Gasoline, Gas — 4, 6 and 8 cylinder — 30 HP to 1,000 HP

STERLING ENGINE COMPANY • 1270 Niagara Street • Telephone Lincoln 0382 • Buffalo 13, New York

● Depend upon Sterling Diesel Power for Locomotives, Generator Sets, Commercial and Fishing Craft, Lift Bridges, Ventilating Systems, Drilling Rigs, Etc.

Gas Engine Symposiums

Last February, the Pacific Service Employees Association, an employee organization of Pacific Gas & Electric Company, began sponsoring a series of lectures under the general title of "Gas Engine Symposiums." The purpose was to train the men for new compressor stations. The stations are located at Topock Station, 15 miles southeast of Needles, California; Hinkley Station, 13 miles west of Barstow; and an addition to the Kettleman Station, seven miles east of Avenal. Instrumental in organizing the meetings, and to whom a good deal of the credit for its success is due, was Jack W. McCarry, educational chairman.

Despite the fact that some of the personnel attending had to drive as much as 75 miles round trip, the average attendance was 68. Word of the sessions got around and men from Standard Oil, Kettleman North Dome Association and a few small operators came to the classes. Literature for use of the men attending was supplied by Fairbanks-Morse, Sealed Power, General Petroleum, Shell Oil, Quaker State, and DIESEL PROGRESS. Among those who conducted the lectures and answered the questions were Mr. Jim Creek of Thompson Products Co., Mr. Morgan Washburn of The C. Lee Cook Co., Mr. Hal G. Merkel of the Air Filter Division of Royal Heaters, Inc., Mr. Jim Eckles and Mr. Ed Bishop of the Fluor Co., Mr. Hart and Mr. Barnaby of Gracom-Russell, Messrs. Ed Connelly and Harry Mahr of Standard Oil, Mr. Walter Camp of Federal Mogul and Mr. John Rogers of Cooper-Bessemer.

The sessions, lasting over a period of months, were recently concluded. The sponsors and the students unanimously and enthusiastically declared the symposiums a great success.

Etaoin Shrdlu



Tom E. Hughes



Roger D. Williams

It happens in the best ordered of publishing businesses more often than we would like to admit. Last month we announced the promotion of two key personnel at Cleveland Diesel Division of General Motors: Tom E. Hughes who moved up to the position of assistant general manager and Roger D. Williams who took over the post of general sales manager. The captions under the pictures were inadvertently transposed. The photos are herewith reprinted correctly captioned. Our apologies go with this correction.

DIESEL ENGINE CATALOG is now available in its Sixteenth expanded edition. Completely revised and re-edited, it is an invaluable aid to design engineers and buyers. Fully illustrated. \$10.00. Order now from **DIESEL PROGRESS**, P.O. Box 8458, Cole Station, Los Angeles 46, California.

DIESEL PROGRESS

Portable Electronic Trouble Locator



The problem of locating friction noises in bearings, pistons, gears, ratchets, cams, clutches, traps, pipe lines, valves and other mechanisms is answered by a new, portable electronic instrument, according to Anco Instrument Division of Chicago, the manufacturers. Known as the Elec-Detec, this electronic stethoscope employs a metal probe which serves as a microphone transmitting impulses electrically to headphones. It localizes the source of tell-tale noise, helps diagnose the trouble and determine quickly where to make repairs without tearing down the entire equipment, it is stated. According to the manufacturer, the electric amplifier and the sensitivity control on the Elec-Detec make it possible to detect sounds at low speed that otherwise could be heard only at high speeds. Even the tick of a fine watch and sounds that are not normally audible are clearly defined through this instrument, while airborne sounds do not register. Elec-Detec is furnished complete with high impedance type headphones, batteries, and leather carrying case. Further details can be obtained direct from Anco Instrument Division, 4254 West Arlington Street, Chicago 24, Illinois.

Chicago Metal Hose Catalog

A 16-page catalog prepared especially for product designers' use has been published by Chicago Metal Hose Corporation, Maywood, Illinois. This catalog was prepared to give complete descriptions and specifications of the many products manufactured by Chicago Metal Hose Corporation for original equipment manufacturers' use. It is designed for quick reference and ready access to pertinent information. Information on metallic bellows of stainless steel, brass, bronze and other alloys are included. Complete specifications giving the pertinent characteristics of the complete size range of these bellows which are used in many types of controls, regulators and thermostatic devices are given. For applications such as steam traps, instruments, valves, shaft seals and many others, a guide to the proper selection can be obtained from this bulletin. Also included is complete information on the company's several types of flexible hose and tubing with pertinent information as to pressures, temperatures and sizes as well as suggested applications. Data on flanges, couplings and fittings round out the information which makes this catalog a complete treatise on the company's products. Copies are obtainable from the company, Chicago Metal Hose Corporation, Maywood, Illinois.

Deceased

Howard W. Pound, 55, vice president and manager of Air Filter Sales Division, American Air Filter Company, Inc., Louisville, Kentucky, recently passed away. He was a graduate of Purdue University, veteran of World War I, member of the American Society of Heating and Ventilating Engineers and an engineer of long experience in the air filter industry.

DECEMBER 1951

THIS QUICK-CHANGE HEAD REALLY SAVES DOWN TIME and MANPOWER



HOFFMAN FILTERS

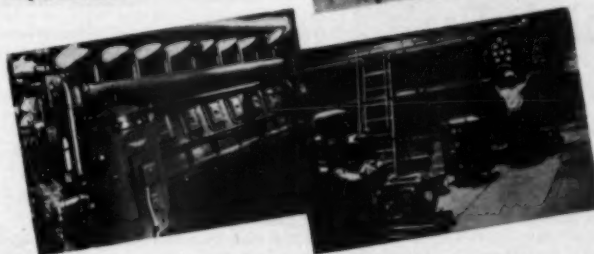
for Diesel Fuel and Lube Oils

Simply back off the swing-bolts — turn a hand-wheel, and the cover of your Hoffman Cartridge Filter lifts and turns aside for fast, convenient cartridge changes!

Hoffman builds two series of cartridge filters. One employs Navy 7x18 throwaway units; the other uses 11x18 cartridges, either throwaway or repackable type. Both series provide efficient, dependable removal of contaminants from fuel and lubricating oils — for low cost.

WRITE FOR BULLETINS

Full descriptions and specifications are contained in Bulletins A-649 and A-703. Write for them. Illustrated here are three typical Diesel installations protected by Hoffman filters. Get the facts for your requirements.



FILTRATION
ENGINEERING
SERVICE...

For the right answer to your filtering problems, a Hoffman filtration engineer will survey your requirements and furnish recommendations based on detailed analysis of all factors. Ask for this service—There is no obligation.

HOFFMAN

FILTRATION

DIVISION

UNITED STATES HOFFMAN MACHINERY CORPORATION

212 LAMSON STREET, SYRACUSE 4, NEW YORK

CANADIAN PLANT: CANADIAN HOFFMAN MACHINERY CO., LTD., NEWMARKET, ONT.

New Line of Filters



Hilliard announces a new line of their improved type Hilco Hyflow lubricating and fuel oil filters. These new units include swing-bolt head construction for quick opening of filter covers and a lifting device for ease of handling the cover. Filters are available using

factory-made throwaway cartridges or the repackable type which the operator repacks from bulk supply of filtering materials. Filtering materials are available for use in these units for handling

straight-run mineral oils or the heavy-duty detergent type oils, a feature being that all types of filter cartridges, both factory-made and the repackable type, are interchangeable. Hilco filters are available in capacities ranging from 1/2 gpm. up to 1000 gpm., for fuel filtering, lubricating oil bypass, or full-flow filtering. For further information on Hilco filters, write the Hilliard Corporation, 122 West Fourth Street, Elmira, New York.

Murphy Diesel Agency for Los Angeles

The Industrial Diesel Service Inc., 5315 Valley Blvd., Los Angeles, California, has been appointed as exclusive distributors for Murphy Diesel in the immediate Los Angeles area which stretches out to

San Bernardino, Riverside, etc. The new Murphy agency is headed up by Ed Anglenmyer, who is assisted by George Rice and Lee Stewart.

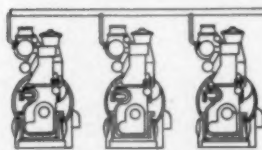
An Advanced Pyrometer



The extreme importance of continuously monitoring all engine temperatures cannot be over-emphasized. Dependable instrumentation of all parts, whether they be the bearings, cylinders or generator fields is essential if valuable and needed equipment is to be kept operative with a minimum of down-time. Serious damage to expensive machinery can be prevented when proper warning of impending trouble is given. The pyrometer serves an important function in rendering such warning.



The new "Alnor" Pyrotac is another forward step in the use of such instrumentation. It can be used to sound an alarm, shut down the engine or both in the event that temperatures rise above predetermined point. The Pyrotac is of the overlapping type. (That is, the new thermocouple is connected before the old thermocouple circuit is broken. Thus the pyrometer pointer does not drop then to ambient temperatures between readings.) An out of balance reading, therefore, is indicated by an appreciable motion of the pointer.



In a multiple engine plant, an instrument can be connected to the couples installed in the common exhausts of each engine and thus sound an alarm if any one engine is overloaded. Up to 13 circuits give a combined reading for all engines. A switch pointer can be stopped at the number of the offending engine by pressing a spring loaded button on the meter panel, thus locating the source of the trouble.



Similarly, an instrument can be connected to the thermocouples installed in each main bearing of an engine to sound a warning of over-heated bearings.



"Pike's Peak or Bust"

And it is never hard to "bust". For covered wagon stragglers, the redskins lay in wait. Now, it's competition that liquidates the inefficient.

Like pioneers who led the way, many Diesel owners already have the full competitive advantage that

comes from using PORUS-KROME* and VANDERLOY M.

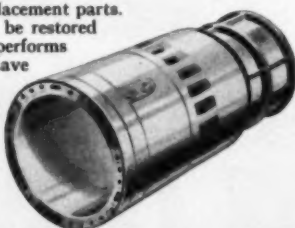
They no longer have the expense of stocking odd-size parts. Instead, their cylinders and crankshafts, no matter how badly worn, are brought back to original dimensions — just as yours can be.

No need, then, to worry about where to get new replacement parts.

For less cost, all cylinders and crankshafts can be restored repeatedly. And PORUS-KROME wears much longer, performs more efficiently — so much so that it pays to have original equipment processed with it.

That's standard practice, now, with many Diesel owners. Competitively, they're headed for "Pike's Peak"—and with very little chance to "bust".

*PORUS-KROME is a dense, hard, wear and corrosion-resistant chromium, produced by the Van der Horst Corporation of America, and which gives working surfaces an infinite number of tiny oil-retaining reservoirs for perfected lubrication.

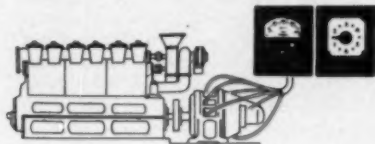


VAN DER HORST CORPORATION OF AMERICA • OLEAN, N. Y.

U. S. PATENTS 2,048,578, 2,314,604 and 2,412,441

PORUS - KROME VAN DER HORST

A Pyrotac with a suitable temperature range can be connected to the thermocouples commonly installed in the fields of large generators to give a warning of excess heat and danger of burnout.



The Pyrotac is simple and rugged. The meter movement is the same unit that has contributed to the popularity of "Alnor" pyrometers in gas and diesel engine plants. The contact making mechanism is non-electronic—no "tuning" adjustments are necessary. The motor operated switch is a comparatively new design which has test proven itself over years of field use.

Appointed to Seattle Office



Edward D. Van Fossen

The appointment of Edward D. Van Fossen to Cooper-Bessemer's regional field office in Seattle, Washington has been announced by Stanley E. Johnson, Cooper-Bessemer vice president. Working directly under Robert C. Jones, branch manager, Mr. Van Fossen will concentrate his efforts in furthering Cooper-Bessemer's engineering service to users of heavy internal combustion engines, pumps and compressors in the northwest sector of the country. A Navy pilot during World War II, Mr. Van Fossen graduated in mechanical engineering from the University of Washington and has been associated with the Cooper-Bessemer Corporation for the past three years at their main plant in Mount Vernon, Ohio. He will devote attention to needs of gas, gas-diesel and diesel engines, engine driven compressors and liquid pumps in use on marine, industrial, chemical, petroleum processing and gas transmission applications.

To Set Up Clinic at Show

Buda, Hercules and Cummins diesel engines will be set up in a special interest clinic in the forthcoming Southwest Automotive Show to be held in Houston, Texas March 20-23, 1952. Each manufacturer will have diesel engineers present to discuss power problems with fleet operators and others interested in the use of diesels. It is expected that all major engine manufacturers will be included in this large exhibit which will become an important part of this 10th annual show which is expected to attract a large attendance from the four state southwest area. About 250 nationally known manufacturers of automotive shop equipment, tools, parts, accessories, chemicals, and supplies will occupy more than 500 booths which are possible to obtain in the Sam Houston Coliseum.

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DECEMBER 1951



Not nearly so tough

with a
**TWIN DISC TORQUE
CONVERTER**

Have you heard what Bagdad Copper Corporation is reporting on its Buda-powered Dart Trucks in which the power is put to work through the new Twin Disc DF Hydraulic Torque Converters?

"The trucks negotiate the steep grades fully loaded and without ever shifting gears . . ."

"They return down grade without using the brakes . . ."

"Total maintenance and repair costs may be less than 2 cents per ton . . . far less maintenance than ever before . . ."

"Fuel costs per ton of ore hauled with

the torque converter have decreased instead of increasing as was presumed."

The Twin Disc Model DF is a three-stage hydraulic torque converter with built-in converter braking feature which not only eliminates gearshift guesswork on grades but also, combined with engine drag, can perform 90% or more of the braking. The records the DF is setting are amazing. Write today for details. You may be able to save hundreds of dollars per unit in maintenance savings and faster round trips.



TWIN DISC CLUTCH COMPANY, Racine, Wisconsin — HYDRAULIC DIVISION, Rockford, Illinois
BRANCHES: CLEVELAND • DALLAS • DETROIT • LOS ANGELES • NEWARK • NEW ORLEANS • SEATTLE • VOLGA

New Assignment

The Baldwin-Lima-Hamilton Corporation, Eddystone, Pennsylvania, announced that, in view of the larger backlog of orders for defense products and other lines of standard equipment, a new assignment of responsibility has been made in the operating management of its Eddystone plant. Under the new organization, Mr. John S. Newton, vice president, will have complete responsibility for the locomotive division, including locomotives, renewal parts and other related equipment. Mr. Raymond B. Crean, vice president, will have complete responsibility for the Southwark Division, including hydraulic turbines, presses, power tools, testing machines and other products built in the

company's Southwark shops. Mr. James R. Weaver, vice president, will have complete responsibility for the newly created Defense and Special Products Division, including military equipment, foundry products, dump cars and all other products built at Eddystone, except the locomotive operations and the products of the Southwark shop.

Sturtevant Issues Catalog

Westinghouse Sturtevant has just published a 16-page, condensed full-line catalog. Equipment for air conditioning, for air handling, and for air cleaning is described in considerable detail. Under air conditioning equipment will be found: unit air conditioners, unit heaters, home electronic air

cleaners, hermetically sealed compressors, and condensers and water coolers. What the equipment consists of, its features, and its specifications are included. The air handling section includes: ventilating equipment, air conditioning equipment, heating equipment, general purpose and industrial fans, and heavy duty and mechanical draft fans. Specifications and capacity data are in considerable detail. The third and final section, the electronic air cleaning section, includes: Precipitron — principle of operation, home air cleaners, horizontal air cleaner, vertical air cleaner, and oil mist control unit. The how-it-works and how-to-use-it information is in useable form. For a copy of this Booklet B-5164, write Department T, Sturtevant Division, Westinghouse Electric Corporation, Hyde Park, Boston 36, Mass.

Sales Engineer



James H. Burtis

The appointment of James H. Burtis as sales engineer, four-cycle engine department has been announced by R. W. Bayrelein, vice president, Heavy Machinery Division, Nordberg Manufacturing Company, Milwaukee 7, Wisconsin. Mr. Burtis has a degree in electrical engineering from Columbia University where he later took additional engineering courses. Prior positions include work with the Chicago Procurement Office of the U. S. Army Corps of Engineers, Fairbanks-Morse, the Rural Electrification Administration, the Consolidated Edison Company of New York and the New York Central Railroad.

Passed Away

Mr. Sterling "Wes" Baldwin, who was associated with the Snow-Nabstedt Gear Corporation of Hamden, Connecticut for the past twenty-three years in the capacity of chief service engineer has passed away. Mr. Baldwin, known by many of the marine engine service personnel and boatmen in the country as "Baldy" died suddenly at the age of 52. He was a native of New Haven, Connecticut and Waldoboro, Maine.

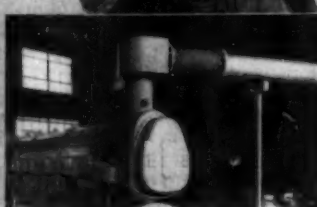
Union Pacific Purchases Diesel Units

The Union Pacific Railroad has purchased for use on its California division eight transfer diesel locomotives. Resembling conventional switchers, the units feature 2,400 horsepower with speeds up to 65 mph. Total cost is about \$1,720,000. Reflecting paint as trim is an added safety factor to prevent vehicles from running into the locomotives when working at crossroads. The units will be used to push freight trains over steep grades. They were built by the Electro-Motive Division of General Motors.

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DIESEL PROGRESS

Large Diameter CMH REX-WELD CORRUGATED FLEXIBLE METAL HOSE

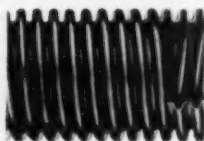


the answer to motion control for:

Diesel Engine Air Intake and Exhaust Lines • Tank Settling Connections • Safety Valve Vent Piping • Compressor Vibration Connections • Heavy Duty Loading and Unloading • And Many Other Services

Wherever large diameter connections must have the flexibility to absorb vibration or expansion and contraction, correct for misalignment or allow movement, and yet provide the rugged durability of metal, CMH REX-WELD Type RW-75 is the answer. REX-WELD Type RW-75 is the flexible connection that requires no packing, no periodical maintenance. All metal construction is completely gas and liquid tight.

For full information and data sheets see your local CMH distributor—look for his name in your classified telephone directory—or write direct.



CMH REX-WELD Type RW-75 is helically corrugated flexible steel hose and is made in sizes from 5" to 24" I.D., inclusive. Furnished with standard pipe nipples, couplings, fixed or floating flanges. Flanges in customer design can also be attached. Where required RW-75 can be supplied with metal braid covering.

Please identify CMH products that have served industry for over 40 years



CHICAGO METAL HOSE Corporation

1325 S. Third Ave. • Maywood, Ill. • Plants at Maywood, Elgin, Rock Falls and Savanna, Ill.
In Canada: Canadian Metal Hose Co., Ltd., Brampton, Ont.

CMH

ONE DEPENDABLE SOURCE
for every flexible metal hose requirement

Answer to Water Power Shortage

Due to the low water this year in the Northwest, it has been estimated that the region will suffer a power shortage of at least 300,000 kw. The load that will be curtailed will be the aluminum production. DEMA's answer to the suggestion that these plants be moved elsewhere is in the following telegram which was sent to Charles E. Wilson, Director, Defense Mobilization, Washington 25, D.C.

"The Diesel engine industry offers you its facilities to quickly and economically eliminate the power shortage reported in the Pacific Northwest. As you know, the Diesel industry has built engines which now supply large segments of the aluminum industry with some of its cheapest and most reliable power and is now building hundreds of thousands of horsepower for new aluminum plants. Our industry has the plant facilities to furnish the necessary equipment to relieve in a short time the power plant shortage in the Northwest, which we understand is at least 300,000 kw. Our builders of this equipment stand ready to meet with you or anyone else at any time to discuss in detail what we can do to relieve this situation." (Signed) Harvey T. Hill, Executive Director, Diesel Engine Manufacturers Association.

Officers Elected at Twin Disc



G. L. Shuman

Roger G. DeLong

Four officers were re-elected, two new vice presidencies created and a group of other top officers elected at the annual meeting of the Twin Disc Clutch Company, Racine, Wisconsin, and Rockford, Illinois. Officers re-elected at the meeting of directors were: chairman of the board, P. H. Batten; president, John H. Batten; vice president-manufacturing, Soren Sorenson; and vice president-sales, N. F. Adamson. Named to new positions were: G. L. Shuman, vice president-finance and secretary. Mr. Shuman who has been secretary-treasurer of the company since September 1943 first joined Twin Disc in February 1928, was made secretary in 1935, secretary and assistant treasurer in 1936. R. G. DeLong, vice president, Hydraulic Division. Mr. DeLong had been manager, Hydraulic Division since 1945, and first joined Twin Disc in 1939, when a new factory was opened in Rockford. R. T. Howell, treasurer-assistant secretary. Mr. Howell became affiliated with the company in mid-1940 and was named assistant-secretary in February, 1942. R. T. Rehwald, assistant secretary-comptroller, Hydraulic Division. Mr. Rehwald had been assistant secretary of the Hydraulic Division since 1942 after joining the division early in 1941. W. F. Shurts, director of engineering. Mr. Shurts, who joined the organization in 1940, had been chief engineer of the Hydraulic Division since 1942.

DECEMBER 1951



The wide Variety of uses for diesel engines

certainly demands specialized engineering. Each type of engine must be built for specific operating conditions. Likewise, the bearings, as well as other parts, need to be designed for the required load, shock, speed, temperature and other service considerations. Johnson Bronze furnishes the bearings for a majority of the diesel builders because, through extensive research and engineering cooperation, we have designed and produced the right bearings. Among the preferred types are aluminum alloy bearings and lead or tin base babbitt on either bronze or steel backs. Every Johnson bearing is made of quality material and finished to precise specifications.

You will find Johnson engineers willing to help you decide which type bearing is best suited and to design it to the application. Write, wire or call today!

Johnson Bronze
SLEEVE BEARING HEADQUARTERS
445 SOUTH MILL STREET • NEW CASTLE, PA.

Cell JOHNSON BRONZE at ATLANTA • BALTIMORE • BUFFALO • CAMBRIDGE
CHICAGO • CINCINNATI • CLEVELAND • DALLAS • DENVER • DETROIT • INDIANAPOLIS
JACKSONVILLE • KANSAS CITY • LOS ANGELES • MINNEAPOLIS • NEW YORK • NEWARK
PHILADELPHIA • PITTSBURGH • ST. LOUIS • SAN FRANCISCO • SEATTLE

Parts Cleaning Machine



The Equipment Division of the Magnus Chemical Company, Inc. announces the new 1952 Aja-Lif parts cleaning machine for the cleaning of automotive, truck and bus engine blocks and disassembled parts. It is all done with your air compressor. It is air powered, not air agitated. It features single lever operation. A flick of the operating lever brings the platform to the top of the tank, out of the liquid, for inspection, loading and unloading the work. A second flick

of the lever lowers the platform to the bottom of the tank where the work is automatically and vigorously agitated up and down in the solution "shearing" the dirt from the parts, eliminating hand scrubbing and brushing. The Aja-Lif is available in three sizes. Heating is by gas, steam or electricity. For information and specifications write the Equipment Division, Magnus Chemical Company, Inc., Garwood, New Jersey. Ask for bulletin 703-AL.

Great Northern Orders Diesels

Purchase of 47 new diesel-electric locomotive units costing an estimated \$8,150,000 was authorized by the Great Northern Railway Company board of directors which met in New York City recently.

Since 1885

UNSURPASSED DEPENDABILITY...

Today's modern UNION Diesel products*
incorporate and pioneer improvements which assure
unsurpassed dependability for your —
**Greater Safety • Lower Operating Costs
Long Term Satisfaction • Increased Profits**

UNION DIESEL

2121 DIESEL STREET • OAKLAND 6, CALIFORNIA, U.S.A.

* DIESEL ENGINES
DUAL-FUEL ENGINES
GENERATOR SETS
HEAT EXCHANGERS
ALARM SYSTEMS
CUSTOM MACHINERY

The units will make up 26 new locomotives, with delivery scheduled for 1952. The locomotives will include 15 of 1500 horsepower for road and switch duty, seven of 4500 horsepower for freight, two of 3000 horsepower for passenger service, one of 3000 horsepower for freight and one of 6,400 horsepower for freight.

Appointed Manager



Harry J. Noles

Harry J. Noles has been appointed manager of the air filter division of the American Air Filter Company, Inc. to succeed the late Howard W. Pound, according to an announcement by William M. Reed, president. Mr. Noles, formerly assistant manager of the division, joined the company in 1928 while still a student at the University of Kentucky where he studied mechanical engineering. During World War II he was plant superintendent in charge of construction of ship sections which the company built for the U. S. Navy and prior to that was an application engineer in the air filter division. He is at present a member of the Standardizations Committee, Air Cleaning Division of the Association of Iron and Steel Engineers and has served on numerous air cleaning committees of technical societies.

Rock Island Takes Delivery of Diesels

The Rock Island Lines has revealed that it has taken delivery of 12 diesel freight engines since October 1st and that on November 1st, deliveries started on 15 new suburban diesel engines, thus bringing closer the goal of full dieselization of the railroad by the end of the year. Latest diesel acquisitions were general purpose models of 1500 horsepower. They will be used on various parts of the system for powering freight trains. Each cost more than \$148,000. They were made by the Electro-Motive Division of General Motors Corporation at the LaGrange (Illinois) plant. The suburban diesels will be of 1600 horsepower, are manufactured by the American Locomotive Company, Schenectady, New York. Their delivery provides for virtually full dieselization of the Rock Island's suburban operations from Chicago.

Buys Detroit Air Filter Company

The Air-Maze Corporation, Cleveland, Ohio, has purchased the Detroit Air Filter Company of Woodstock, Illinois. The manufacture of "Detroit," "Arco," and "Dustay" filters will be continued at Woodstock. The filters are of the throw-away type and incorporate "wick action" as a method of holding more adhesive on the filter media.

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Light Plant Solves Problems of Sticky-Rings and Carbon-Build Up

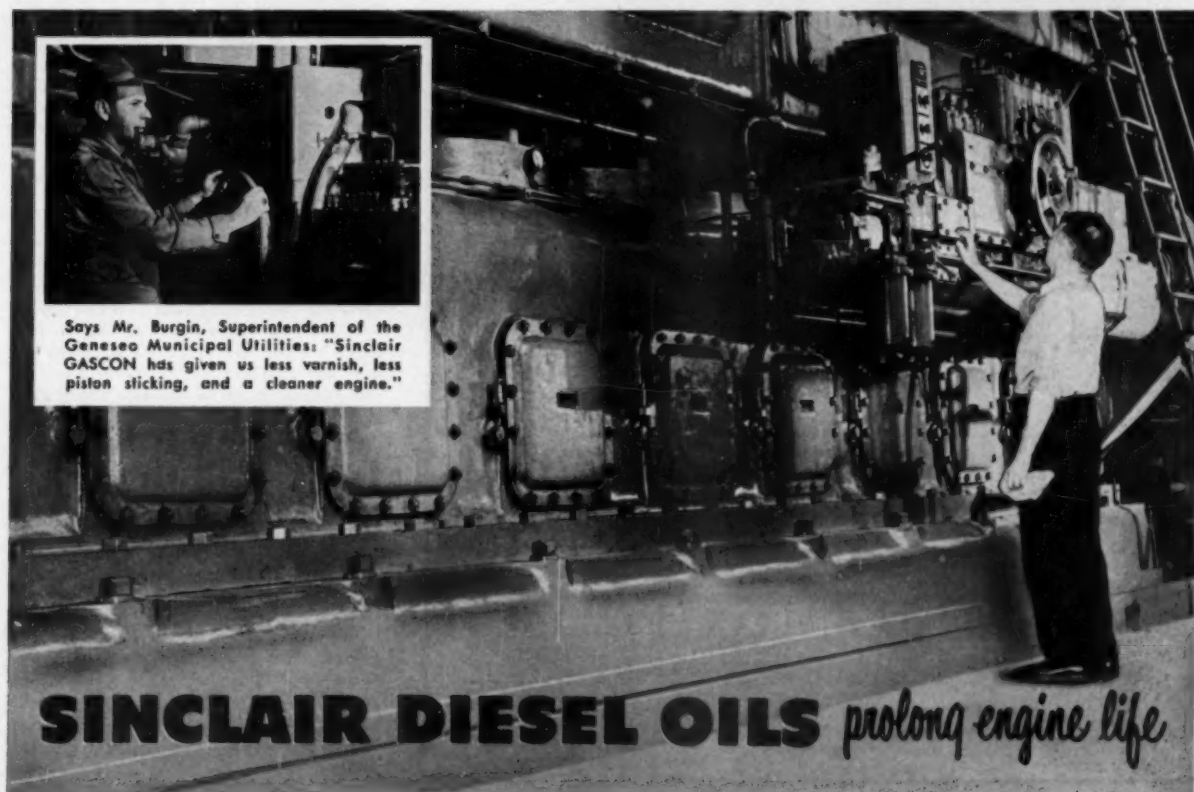
● For quite some time the Light Plant of Geneseo Municipal Utilities, Geneseo, Ill., had trouble with sticking rings, and with carbon deposits in the exhaust ports of its diesels. A few years ago these diesels were changed over to Sinclair Gascon D. Almost at once, it was noted that the troublesome conditions started to clear up. In the time since, sticking rings have become the rare exception and the carbon deposits are no longer a problem.

Furthermore, in 1947, a 1400 hp. Fairbanks-Morse engine, shown below, was installed and filled with Gascon D. This engine has never had a sticking ring and is running remarkably clean, with exceptionally low cylinder wear.

Perhaps Gascon® Oil can cure your diesel troubles, too. Get in touch with your nearest Sinclair Representative or write Sinclair Refining Company, 600 Fifth Ave., New York 20, N. Y.



Says Mr. Burgin, Superintendent of the Geneseo Municipal Utilities: "Sinclair GASCON has given us less varnish, less piston sticking, and a cleaner engine."



SINCLAIR DIESEL OILS *prolong engine life*

Rounds Out Filter Line

The problem presented in attempting to design a single type of cartridge to do all oil filtering jobs has long been recognized. On some engines, a heavy flow of oil is more essential than complete cleaning in one pass. On the other hand, some engines require a cartridge that will completely clean the lubricating oil each time it flows through the oil filter. To design a single cartridge that would do both these jobs equally well could actually result in an "unhappy medium." In neither case would the cartridge pass the exact amount of oil needed, nor would the oil be cleaned to the exact extent required. Fram Corporation has met this problem by manufacturing two distinct types of

replacement cartridges. The full flow "Filtronic" cartridge where full flow filtration is used and, for engines using part flow filtration but requiring more intensive cleaning, the "Cel-Pak" and "Filtcron" oil filter cartridges. These round out the complete line of Fram filters and replacement cartridges and are currently available through the usual distribution channels.

DEMA Educational Symposium

The DEMA educational symposium which was held last month at the Winslow Engineering Company's plant in Oakland, California presented some very pertinent information by some eminently qualified men. John H. Sheusner, chief engineer

of General Metals Corporation, Enterprise Division and J. J. Meyer, chief engineer, Winslow Engineering Company, discussed the matter of filters with relation to the diesel engine. The panel review of this subject included H. G. Nagel of Fairbanks-Morse and J. H. Caldwell of Cooper-Bessemer. This was the morning session. The afternoon session opened with a talk on "Engineering Challenges in the Diesel Engine Industry" delivered by Otto H. Fischer, president of Union Diesel. An educators panel followed covering the relationship of schools to the industry. It was led by Prof. C. J. Vogt of the University of California. Panel participants included representatives from California Polytechnic Institute, Santa Clara College, Stanford University and the University of Nevada. The session concluded with a discussion on "Preventive Maintenance" with J. H. Caldwell leading the panel. Other participants in this panel were H. P. Henderson, Worthington Pump; H. G. Nagel, Fairbanks-Morse; S. W. Newell, Union Diesel; W. G. Nostrand, Winslow Engineering; and Henry Bahr, General Metals Corporation, Enterprise Division. W. G. Nostrand, vice president, engineering and sales, Winslow Engineering Company, opened the symposium with an address of welcome.

Forms Industrial Sales Division



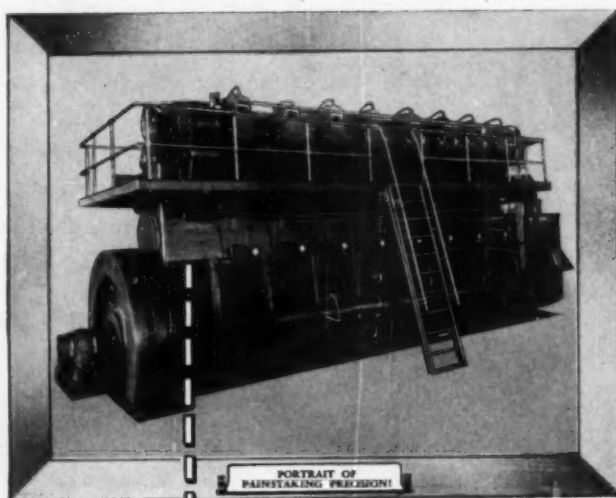
Milton W. Brooks

Formation of a new industrial sales division to develop new markets for component units of White trucks and buses has been announced by J. N. Bauman, vice president in charge of sales. Milton W. Brooks has been named sales manager of the division which will have its headquarters at the White

offices in Cleveland. According to Mr. Bauman, White has sold component units for varied industrial applications. Studies that the company has made over a period of years "emphasize that various White units and production facilities have wide application in many fields such as construction, mining, quarrying, marine and petroleum operations and in many other industrial applications". As a result of these findings, they are gearng their organization to serve those markets in a more specialized way. Mr. Brooks has been a regional sales manager for Cummins Engine Company. He previously had been associated with the American Locomotive Company and Baldwin Locomotive Works in sales engineering assignments.

Twin Screw Diesel Towboat Ordered

St. Louis Shipbuilding and Steel Company has revealed that it has received an order from the Standard Sand & Gravel Company at Wheeling, West Virginia, for an 800 hp. twin screw diesel towboat. The boat will be powered by a pair of Model D-397 Caterpillar diesels equipped with Falk reverse-reduction gears. The craft will also be equipped with Kort nozzles and contraguide rudders. The hull will measure 68-feet by 21-feet by 8-feet.



PORTRAIT OF
PAINSTAKING PRECISION

You Can Count on Fulton Diesels For Dependability... For Economy

Smoother-running • peak operating efficiency •
greater fuel economy • less wear and tear • quick,
easy replacements that save time and money...

Because... even the heaviest parts of every
Fulton Diesel are machined to such close tolerance
that they are completely interchangeable.

FULTON

FULTON IRON WORKS COMPANY

SAINT LOUIS 14, MISSOURI

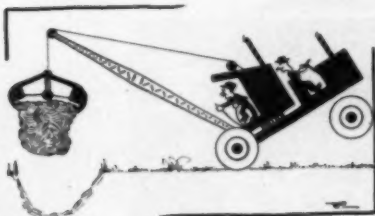
Radio Station Power Insurance



Radio Station WJR's new standby power plant in the background and responsible for the installation, sales engineer J. G. Deakins of Earle Equipment Co., Detroit GM distributors, and right, WJR's design engineer, C. W. Jones.

When engineers of Radio Station WJR in Detroit recently installed a 200 kw. standby generator set they were able to reduce materially their first estimates of the engineering problems involved and the actual time required to complete the installation. Original plans called for a 30-ft. by 20-ft. by 15-ft. building to house the equipment at an estimated cost of \$10,000. This item faded out of the picture, however, when WJR's design engineer, C. W. Jones, focused his attention on equipment which had ample capacity, but was still no longer in size than an average automobile. This eliminated the need for a new structure as space for such an installation was available in a two-car garage adjoining the transmitter building.

The unit selected was a General Motors diesel-electric generator set powered by a twin six GM diesel. The set was installed in one compartment of the garage and only three structural changes in the building were required. A cement block wall was erected to divide the garage in half; ventilating louvers were installed in two sides of the building and a hole was cut in one wall to accommodate exhaust pipes to outside mufflers. With no major building project to complete, the station had standby service available much sooner than originally anticipated. It was desirable to have the unit as close to the transmitter as possible and for this reason the garage, which is only 50 feet distant was an ideal location. Push button starting permits full load operation in a matter of seconds. Complete electrical controls are of the "power house" type and are assembled in an easily accessible cabinet of compact size. Ordinary radiator cooling was sufficient for the engines and consequently no elaborate plumbing system had to be added to the underground maze of power, water and fuel lines already existing near the building.



DECEMBER 1951



Trouble ahead? TELLITE TELLS!

Operators often forget to check engine gauges. Result: bearings burn out, engines heat up, generator systems fail, etc. And your reputation for building dependably performing engines (or operating them) starts down the hill. It's not your fault, but what can you do?

Plenty—you can install Rochester TELLITE Visual Warning Systems. New, unique TELLITE gives operators a virtual fool-proof warning when trouble begins—before damage is done. A pilot light glows steadily under normal conditions. But when something happens—Wham! . . . That light starts flashing brilliantly.

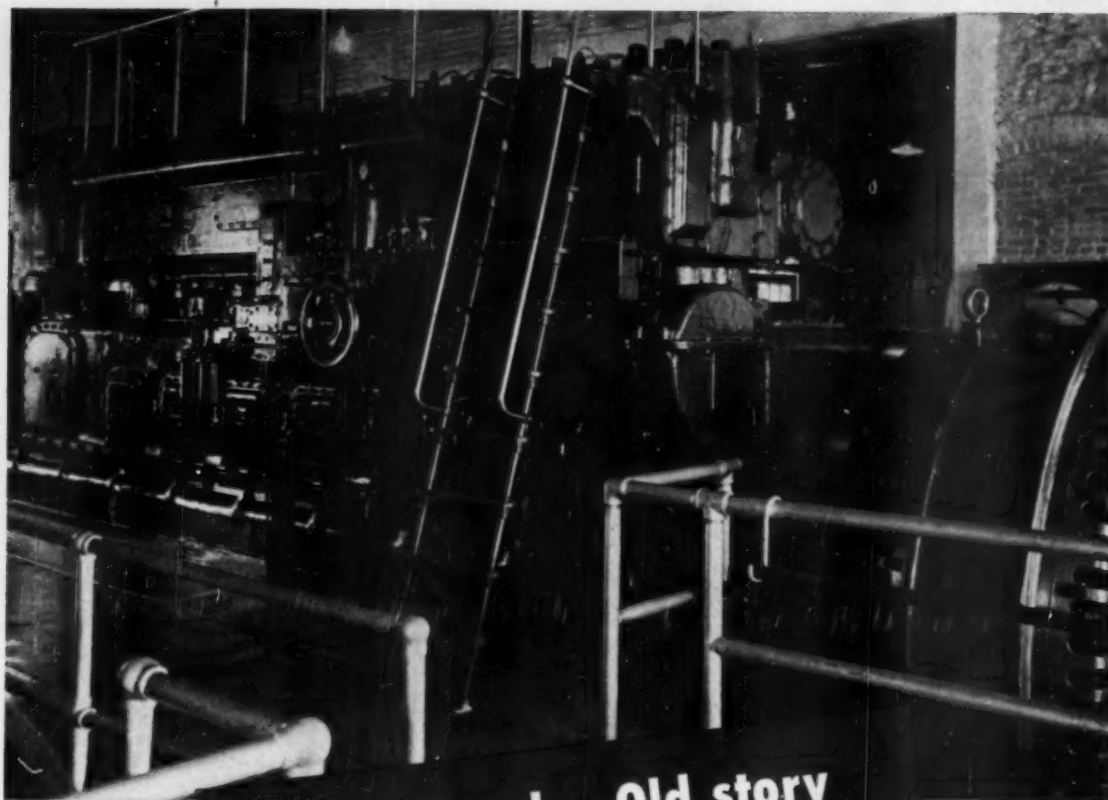
TELLITE gives the initial warning of trouble ahead. ROCHESTER GAUGES accurately and dependably indicate where the trouble lies—before it's too late. Whatever your instrument problem, the chances are a standard ROCHESTER gauge can handle it. Write ROCHESTER MANUFACTURING COMPANY, 101 Rockwood Street, Rochester 10, New York.

ROCHESTER

MANUFACTURING COMPANY, INC.

DIAL THERMOMETERS GAUGES AMMETERS





New diesel...Old story

• When the city of Garnett, Kansas, placed this 1,400-HP diesel in service in the municipal power plant early in 1948, STANDARD HD Oil was the logical choice for a lubricant. The superior performance of Standard fuels and lubricants was already an old story to operators at Garnett, since they had been used for over 20 years in the plant's other generating equipment. One diesel, for example, has logged over 70,000 hours and is still running with the original pistons. A set of rings consistently

delivers over 20,000 engine hours.

Since installation of the new equipment, lubrication has been trouble-free and exceptionally economical with consumption averaging better than 9,000 HP-hours per gallon of lubricant consumed.

A Standard Oil lubrication specialist can help put STANDARD HD Oil to work to your advantage in your own diesels. For his services, call the Standard Oil Company office in your own area, or write: Standard Oil

Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.

STANDARD HD

TRADE MARK

OIL

STANDARD OIL COMPANY



(Indiana)

Now Turbocharged

TO PRODUCE GREATER HP AT THE SAME MEDIUM SPEEDS

Here's the diesel specifically designed for Turbocharging.

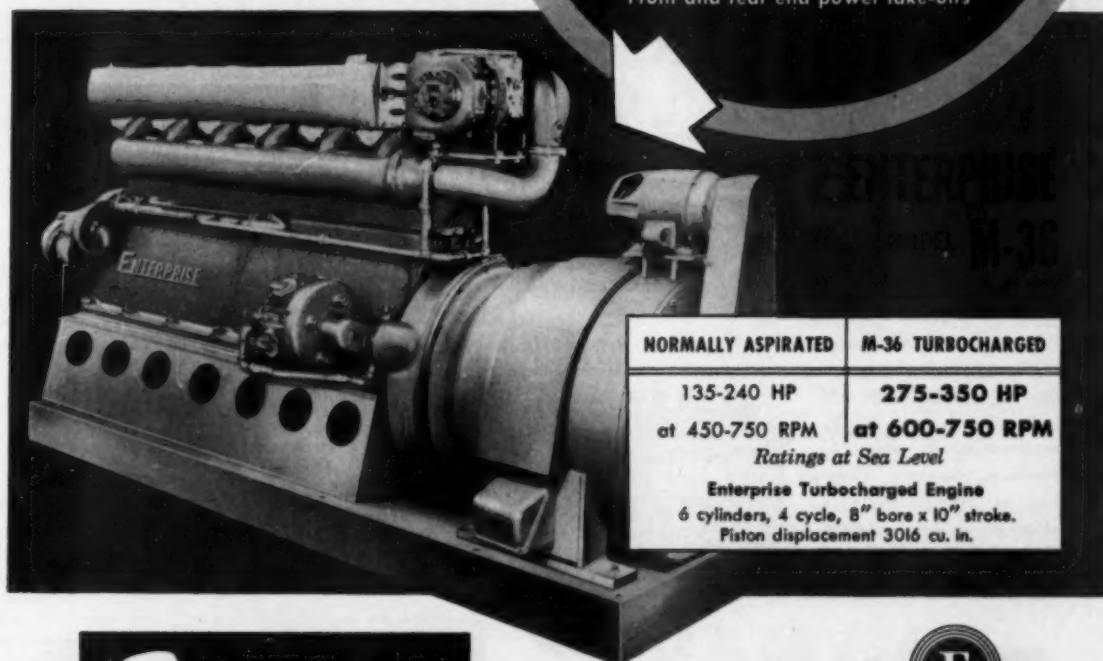
Together with this advancement in low power heavy duty engines is the unmatched efficiency made possible through Enterprise intercooling. This development permits the engine to maintain uniform mean cycle temperatures comparable to normally aspirated engines—without increasing thermal stresses and bearing loads.

Get complete information today. See why Enterprise offers the best in heavy-duty, continuous service, medium speed diesels—for every stationary power use.

ENTERPRISE OFFERS

ALL THESE OUTSTANDING FEATURES IN TURBOCHARGED DIESELS OF THE LOW HP RANGE

- Solid injection, individual fuel pumps
- Enterprise intercooling
- Efficient performance on low cost fuels
- Low fuel consumption
- Smooth, quiet, vibration-free operation
- Integrated design, easy accessibility
- Clean running, low maintenance
- Rugged construction, continuous round-the-clock operation
- Front and rear end power take-offs



NORMALLY ASPIRATED

135-240 HP
at 450-750 RPM

M-36 TURBOCHARGED

275-350 HP
at 600-750 RPM

Ratings at Sea Level

Enterprise Turbocharged Engine
6 cylinders, 4 cycle, 8" bore x 10" stroke.
Piston displacement 3016 cu. in.

Enterprise
DEPENDABLE
Diesels

The Choice of Power Experts



ENTERPRISE ENGINE & MACHINERY CO.

A Subsidiary of General Metals Corporation

18th & Florida Streets, San Francisco 10, California

Diesel Fuel Survey Released

Analytical data for 303 samples of four grades of diesel fuel highlight the report of the second national annual diesel-fuel survey conducted jointly by the Bureau of Mines and the American Petroleum Institute and just released with its announcement by Secretary of the Interior Oscar L. Chapman. Recognizing the need for up-to-date information on the available kinds and qualities of diesel fuels in view of the enormous increase in the use of dieseled units, the first survey was undertaken last year. The 1951 survey, conducted in a similar manner, covers 37 more fuel samples than last year and includes a number of designations of some samples for recommended use only in winter or summer.

It also establishes new national marketing districts, based on supply systems, refinery locations, traffic arteries, etc. instead of employing the 1950 districts which were based on motor-gasoline surveys. The samples represented the products of 49 manufacturers, 7 fewer than the number of refiners contributing data in 1950.

Samples of diesel fuel typical of actual shipments were taken during 1951 and analyzed according to accepted uniform procedures by the manufacturers of the fuels. Fourteen tests were applied to the samples and the results were forwarded to the Bureau of Mines for study and compilation. Of the 303 samples tested, 139 are diesel fuel for city buses and similar equipment, 112 are for heavy trucks,

tractors, etc., 27 for railroad diesel engines, and 25 for large stationary plants and marine diesels. The report presents the tabulated data in four grade groups in accordance with specified limitations set by the American Society for Testing Materials.

A comparison with the 1950 survey shows that there has been little change in the quality of diesel fuels during the past year. In general, the data indicate that high-quality fuels are being supplied to meet the special requirements of the various grades. A free copy of "Report of Investigations 4830 — National Annual Diesel-Fuel Survey, 1951", by O. C. Blade, Bureau petroleum chemist, may be obtained from the Bureau of Mines, Publications Distribution Section, 4800 Forbes Street, Pittsburgh 13, Pa.



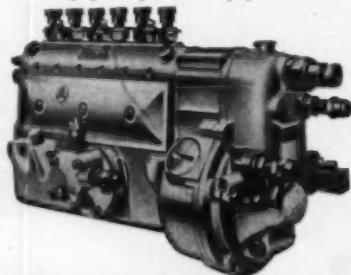
Confidence Abroad



Transport operators all over the world have learnt to trust this sign.

In any language the letters on the C.A.V. sign stand for first-rate service facilities, maintained by highly-trained craftsmen, using special precision equipment.

Wherever vehicles fitted with C.A.V. Fuel Injection Equipment are exported — whether to Trondheim, Santiago, Hong-Kong or Sydney — there's a service agent or depot to give it the specialist attention needed for such high-precision equipment.



Fuel Injection and Electrical Equipment

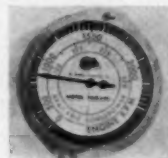
Service Depots throughout the World

C.A.V. DIVISION OF LUCAS ELECTRICAL SERVICES INC., NEW YORK 19, N. Y.

Sales Office:

14820 DETROIT AVENUE, CLEVELAND 7, OHIO

Special Tachometer Dial



As a reminder that maximum horsepower is available only at the governed speed of the engine, Cummins Engine Company, Inc., in Columbus, Indiana, has designed and copy-

righted special dial faces. Company officials point out that the new face design will show the driver the approximate available horsepower as well as engine rpm. at all times. Old design tachometer dial faces only showed an engine's rpm. Cummins Service Department technicians believe this new tachometer dial face will help the driver and prevent engine lugging. Lugging results when drivers continue to "pour on the fuel" when an overload condition causes the engine rpm. to drop near the stalling point. To prevent this condition, the driver must shift to a lower gear allowing engine rpm. to return to governed speed at which maximum horsepower of the engine will be available. New special tachometer dial faces for six different models — all for Stewart-Warner tachometers — are now available for Cummins diesels. Owners can obtain these new tachometer dial faces by contacting any Cummins dealer or by writing Cummins Engine Company, Inc., at Columbus, Indiana, and indicating the model number of the tachometer installed on the equipment.

Promoted to Regional Sales Managership



D. C. Prescott

Promotion of D. C. Prescott, district manager in St. Louis of locomotive sales for Fairbanks, Morse & Company, to middle western regional sales manager with headquarters in Chicago, was announced recently by V. H. Peterson, vice president in charge of the railroad division. Mr. Prescott joined the company in 1949. Previously he was with the Baldwin-Lima-Hamilton Company and the Union Pacific Railroad. His new territory will include St. Paul, Minneapolis and St. Louis.

KEEPING PACE WITH DIESEL PROGRESS

★ COMPLETE MAINTENANCE AND SERVICE

DIESEL

★ MULTIPLE AND FLEXIBLE WITH "ON LOCATION" SERVICE AND REPAIR.....

WE SPECIALIZE IN EMERGENCY REPAIRS OF ALL TYPES - CALL WRITE OR WIRE REGARDING ANY DIESEL PROBLEM

WASHINGTON IRON WORKS, INC.
SHERMAN, TEXAS
ESTABLISHED 1874

For Trouble-free Diesel Operation...

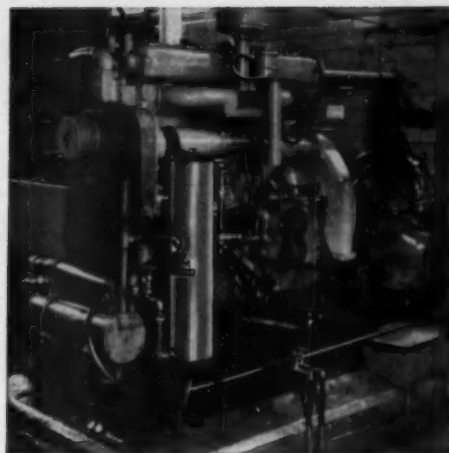
BROWN & SHARPE PUMPS

Send for a copy of this Catalog and see how many quality-built Brown & Sharpe Pumps are available for diesel use. A wide range of types and sizes in standard rotary geared pumps with various styles of special mountings greatly simplifies the right selection for the job. Have a catalog handy for quick reference. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

WIDE SELECTION PERMITS THE RIGHT CHOICE

We save buying through the Distributor

BROWN & SHARPE INC.



Fram Filter Installation on Murphy Diesel at New London, Conn., Waterworks

FRAM Filters Assure Dependable Diesel Operation at Pumping Station

PUMPING STATION Supervisor Walter F. Mahoney says words cannot express the excellency of Fram Filters. This station operates 24 hours a day, 7 days a week, pumping water from reservoir into large storage tanks which supply New London, Conn., with water. Reliable operation is vital. Without it, the city would be without water. Fram Filters remove sludge, grit, abrasives and other impurities from lubricating oil, prolong engine life, cut down-time and maintenance costs.

FRAM Filcron Filters Do the Job Better!

- Remove solid and abrasive contaminants 1 micron (.000039") and larger
- Minimize Engine Wear
- Reduce Engine "Down-time"
- Extend Engine Life
- Lower Operating Costs

No matter what your Diesel oil filtering problem—either lube or fuel—Fram can help you conquer it. Write for full information today to:

FRAM CORPORATION, Providence 16, R. I.
In Canada: J. C. Adams Co., Ltd., Toronto, Ontario.

FRAM Filcron
THE MODERN OIL FILTER

Regional Manager Transferred



W. G. Turner

W. G. Turner, regional manager, Cummins southeastern region, with headquarters at Atlanta, has been transferred to Cleveland as regional manager, Cummins Great Lakes region. This transfer in the Cummins regional organization has been announced by W. L. Beck, vice-president, sales, of the company. Mr. Turner was appointed regional manager of the southeastern region in March, 1948. Previously, he served as assistant regional manager for the Cummins eastern region, headquarters for which are in New York City. He joined the Cummins sales force in June, 1947, after prior experience in the sales department of Marion Power Shovel Company, Marion, Ohio. Mr. Turner is a graduate of Kenyon College, Gambier, Ohio, and a Navy veteran of World War II.

Manages Ithaca, N.Y. Plant

Frank M. Hawley, president and general manager of Morse Chain Company, has announced the appointment of Louis P. Smith of Waukegan, Illinois, as manager of the company's Ithaca plant. Morse Chain is a subsidiary of Borg-Warner Corporation. Mr. Smith is widely known in the mechanical and industrial engineering fields. A former vice presi-

dent in charge of manufacturing of the French and Hecht Division of Kelsey-Hayes Wheel Company, he was also, just prior to joining Morse Chain, in charge of designing, equipping and staffing a new plant of the Deepfreeze Appliance Division of Motor Products Corporation of Chicago. During 13 years with Chrysler Corporation at the start of his career, he rose to become master mechanic, factory manager, then supervisor of estimating. Born in Newberry, S. C., he was educated at the University of Toledo.

Surface Temperature Thermometer



Pacific Transducer Company, 11921 West Pico Blvd., Los Angeles 64, California, has announced a new surface temperature thermometer for the fast and accurate checking of the outside temperature of pipes, plastic dies and rubber molds; for checking temperatures of journals and other bearings, electric motors and cylinder blocks, etc. The instrument is easily and quickly affixed to any flat surface by applying a small amount of silicon grease which is supplied with the instrument, and sticking the thermometer in place. This silicon grease does not melt and so holds the instrument throughout all ranges of temperature, providing a thermal coupling between the surface to be measured and the thermometer. It is also furnished with a small magnetic clamp for application on steel dies or

other ferrous surfaces. A highly reflective evaporated mirror on the dial insures the thermal element against external radiation. The range is 0° to 300°F calibrated in 2° increments. The Model 310 surface temperature thermometer is 2 inches in diameter with a total weight of one ounce.

Assistant Regional Managers



R. A. D'Amour



G. W. Plondke

Two sales engineers with Cummins Engine Company, Inc., Columbus, Indiana, have been transferred from the factory to Cummins regional liaison offices as assistant regional managers. Their promotions were announced by L. W. Beck, Cummins' vice president-sales. R. A. D'Amour has been appointed to the Washington, D. S. region where John W. Post is regional manager. G. W. Plondke will headquarter at Chicago. Fred W. Hartman is manager of this central region. Both Mr. D'Amour and Mr. Plondke started with Cummins in 1948 and became sales engineers for the company the following year.

Assistant Works Manager

J. S. Askey has joined the staff of the Elliott Company, Ridgway Division, Ridgway, Pa., as assistant works manager. Mr. Askey was formerly superintendent of manufacture, Transportation and Generator Division of the Westinghouse Electric Corporation, East Pittsburgh, Pa. His previous experience includes both engineering and manufacturing supervision of coils and insulation of large rotating electrical apparatus as well as mica products. He has several patents in the field of windings and insulation and has published numerous papers and technical articles.



J. S. Askey

DIESELS for operating ECONOMY

The present day trend toward diesels — both for new installations and for replacements — is largely due to operating economy and dependability.

Current installation practice is to mount them on Korfund Vibro-Isolators.

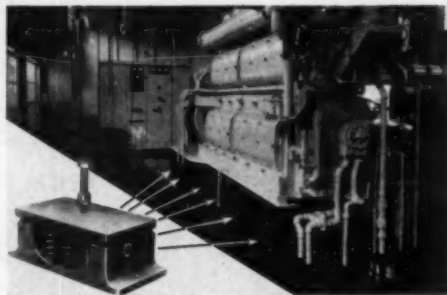
This makes it possible to install diesels anywhere with positive assurance that there will be absolutely no transmission of objectionable vibration. Additional benefits include savings from reduction of building and engine maintenance costs, and frequently the elimination of concrete foundations.

Vibration is absorbed by steel springs which provide the finest isolating medium available. Thrusts are controlled by resilient chocks in the four corners.

The result is smoothed, floating operation at all speeds — in marine, mobile, or stationary installations. The cost is low. Ask for Bulletin G-102. Representatives in principal cities.

The Korfund Company, Inc.

48-208 32nd Place, Long Island City 1, N. Y.



This Alco 975 hp. six cylinder turbocharged main generating unit installed on a mooring barge operated by U.S. Army Corps of Engineers, Memphis District, supplies power for their new dragline bank graders. The unit is mounted on Korfund vibro-isolators for smooth operation, and to prevent bearing misalignment due to hull distortion.

A Few Typical Installations:

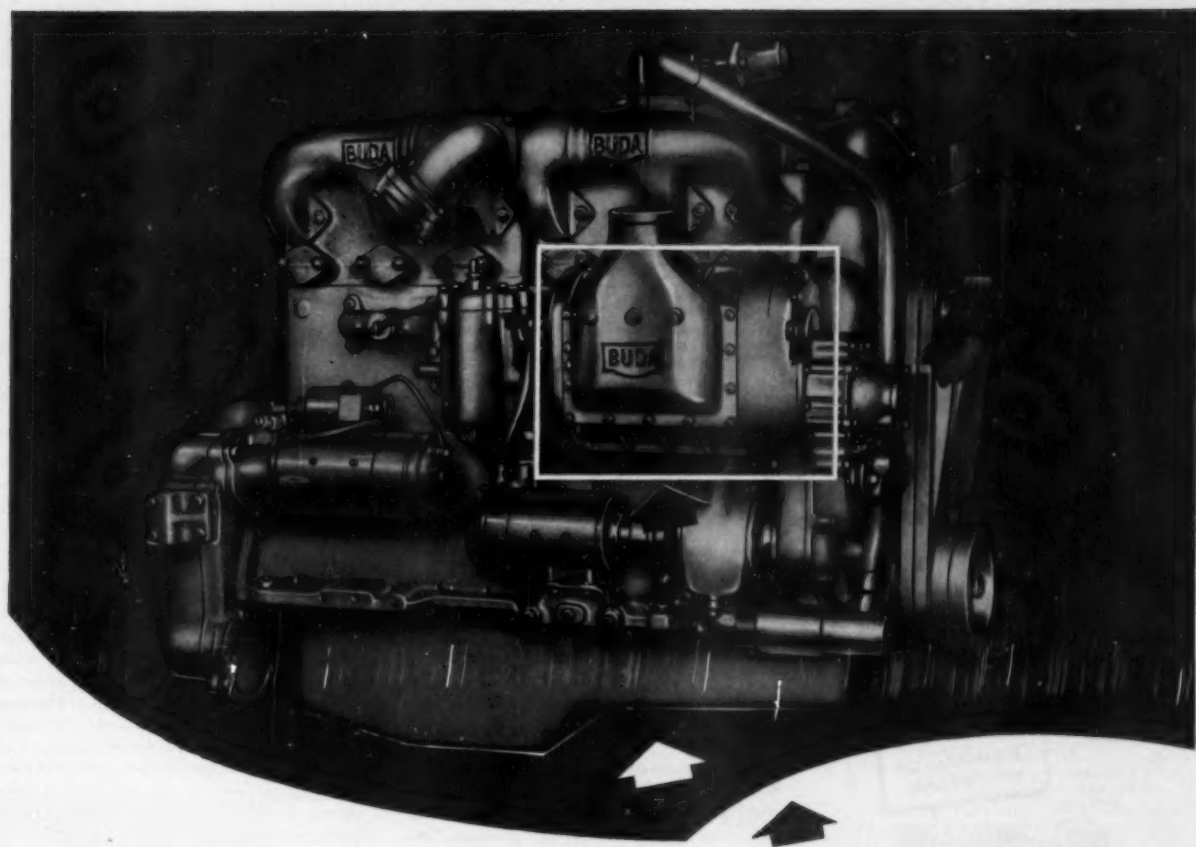
Banger Hydro-Electric Co., Bangor, Me.	4 1425-hp. Worthington
Lenox Hill Hospital, New York	1 730-hp. Worthington
2 Park Avenue, New York	4 450-hp.; 1 730-hp. Worthington
New Yorker Hotel, New York	1 530-hp.; 1 730-hp. Bosch-Sulzer
Naum Department Store, Brooklyn	
	4 300-hp.; 1 180-hp.; 1 150-hp. Worthington
Macy's, New York	1 700-hp. Alco
Floyd Bennett Field, New York	1 450-hp. Fairbanks-Morse
Prudential Insurance Co., Newark, N. J.	1 740-hp. Baldwin
Loose Star Gas Co., Dallas, Texas	1 400-hp. Cooper-Bucconer (Gut)
Sun Oil Co., Marcus Hook, Pa.	4 250-hp. Ingersoll-Rand (Gut)
Cia Central Argentina De Electricidad, Buenos Aires, S. A.	1 270-hp. Sulzer; 2 540-hp.; 1 540-hp.; 1 700-hp. Deutz

KORFUND for operating SMOOTHNESS

See us in Booth No. 251 of the Plant Maintenance Show, Philadelphia, January 14-17.

Approaches New High in Orders

Fairbanks, Morse & Company reports that orders and shipments for the first nine months of 1951 were greater than a year ago and approached new high marks. Robert H. Morse, Jr., president, revealed that orders for the first nine months this year totaled \$96,600,000 and were 21% greater than the total reported for the same 1950 period. Shipments showed an increase of 48% over shipments during the same period last year. "Our backlog of unfilled orders on September 30, stood at \$59,800,000. A very small part of this being direct defense orders," Mr. Morse said. "Our plant modernization program, begun over a year ago, is one of the reasons for the increase in shipments."



BUILT-IN POWER

BUDA Diesels use B-W Superchargers
built in for added horsepower and economy

The Buda Company of Harvey, Illinois, uses B-W Superchargers on their diesels. This automotive diesel engine, Model 6-DAS-844, develops 280 brake horsepower at 2,100 r.p.m. Designed for heavy-duty truck operation both at sea level and altitude. The supercharger on this engine is one of a standard line developed by Pesco Products Division.

For motor truck, marine, railway or general industrial applications, supercharging means savings in engine space and weight . . . means power to pull heavy loads . . . means sea level operation at high altitudes. All these extra benefits without corresponding increases in operating costs.

The engine manufacturer who wants to pack more power into a given engine size . . . or who wants to add an entire new series of models to his line without retooling or the expense of redesign, can do so simply by equipping his present line with B-W Superchargers. One of our engineers will gladly explain how this can be done. There is no obligation. Write today to:



PRODUCTS DIVISION

BORG-WARNER CORPORATION

24700 NORTH MILES ROAD

BEDFORD, OHIO

THOMAS

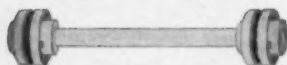
Flexible ALL METAL
COUPLINGS
FOR POWER TRANSMISSION
REQUIRE NO MAINTENANCE

Patented Flexible Disc Rings of special steel transmit the power and provide for misalignment and end float.

Thomas Couplings have a wide range of speeds, horsepower and shaft sizes:

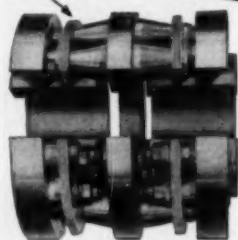
$\frac{1}{2}$ to 40,000 HP
1 to 30,000 RPM

Specialists on Couplings for more than 30 years



PATENTED FLEXIBLE DISCS

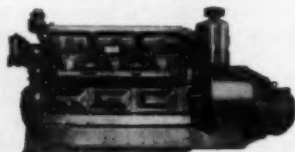
**BACKLASH
FRICTION
WEAR and
CROSS-PULL
are eliminated
Lubrication is
not required!**



THE THOMAS PRINCIPLE GUARANTEES PERFECT BALANCE UNDER ALL CONDITIONS OF MISALIGNMENT.

NO MAINTENANCE PROBLEMS.

ALL PARTS ARE SOLIDLY BOLTED TOGETHER.



FOR SUCH TOUGH JOBS AS: DIESEL COMPRESSOR DRIVES, MARINE MAIN DRIVES, LOCOMOTIVE MAIN DRIVES, AUXILIARY DRIVES, ETC.

Write for the latest reprint of our Engineering Catalog.

THOMAS FLEXIBLE COUPLING CO.
WARREN, PENNSYLVANIA

Dieselized Asphalt Paving Rollers



The compactness of the 2-cycle diesel permitted its installation with torque converter in the engine compartment of this 14 ton asphalt paving roller.

A new trend toward dieselization of road building equipment may be indicated by the performance of seven dieselized asphalt paving rollers recently put to work by George M. Brewster & Son, Inc., contractors of Bogata, N. J. The rollers, supplied by Buffalo-Springfield, are of the 3-axle tandem type and have a working weight ranging from 14 to 20 tons. The rollers are powered by 3-cylinder GM diesels. The installation of diesel engines in this equipment was dependent upon whether or not they could be installed with torque converter drives in the space available in the engine compartment. The power plant selected was compact enough to meet this requirement and the combination is making a sound contribution to a better performance in the rolling operation.

The chief advantage is a new smoothness in the flow of power which drives the roller more evenly under varying load and grade conditions and cuts slippage of the driving roller to a minimum. This

results in a substantial reduction in the rolling time required to complete a smooth, more even pavement, the Brewster Company reports. The rollers were first used by the Brewster Company on three sections of the Jersey Turnpike near Secaucus, Cranberry and Columbus, New Jersey.

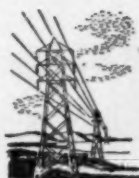
View along the Jersey Turnpike near Secaucus, N. J., where contractor George M. Brewster & Son, Inc. operated the first GM dieselized paving rollers to be produced by Buffalo-Springfield.



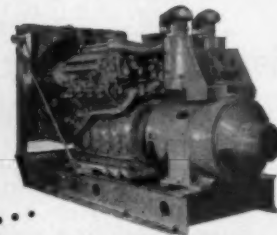
Opens Washington Office

The Marley Company, Inc., manufacturers of Marley water cooling towers and air-cooled heat exchangers, announces the opening of its Washington, D. C. engineering service office in the Wyatt Building at 777 Fourteenth Street, N.W. Don Cousins, formerly associated with the engineering and sales departments of the company in Kansas City, has been named manager of the Washington office. Mr. Cousins is a graduate of the School of Engineering of the University of Kansas. The opening of the Washington office enables The Marley Company to render comprehensive service to both the governmental agencies and private industry within the territory. The services of Mr. Cousins are available in the selection and application of cooling towers.

KNOWN THE WORLD OVER!



Reiner...



DIESEL GENERATORS

Shown above, for example, is one of a pair of 100KW 2400 volt Reiner generators installed in a South American power plant. Everywhere in the world you'll find similar installations, because Reiner auxiliary equipment is known for its efficient, economical, troublefree service.

Reiner generators come in a complete selection of sizes and capacities ranging from 5 to 90KW for D.C. or 50 or 60 cycle A.C. current.



FREE BULLETINS on standard units sent on request. Write today, stating your requirements.

DEPT. 31 12-12 37TH AVENUE
LONG ISLAND CITY 1, N. Y.
Cable Address: REINER INC.

Florida Diesel News

By E. F. DENNIS

JUST LAUNCHED, the 61-ft. x 71-ft. tug, *Samuel A. Belcher*, for Belcher Towing Company is powered with a D "383" Caterpillar 320 hp. engine. It was designed and built by Captain Ross Parker, skippered by Captain Martinez, for Florida waters. Shelley Tractor of Miami supplied the engine.

FOR LATIN AMERICA: three D-8 Caterpillar dozers and two Caterpillar motor grader scrapers, all on the deck of the *M.F. Nevea* of Puerto Cortes Cuba; one International Harvester T.D. 18 with Bucyrus Erie hydraulic dozer; three Caterpillar D-8 dozers, all aboard the *M.F. Santiago* of Porto Lemon, Peru.

DIESELS HIT a new high in Miami bus industry, with the Miami Transit Co. having 92 G.M. "71" series and 20 Mack "C-50" model, both having the torque converter to eliminate jerky acceleration.

THE MIAMI BEACH RAILWAY has 33 G.M. "71's" with the torque converter, and Coast City Coaches reports 17 G.M.'s and 12 more on order.

THE TUG Roy has been repowered with a Caterpillar "D375," 270 hp. and Snow-Nabstedt reduction gears. The owner and captain is John Leonardi. Shelley Tractor Co. of Tampa supplied the engine.

FOR COLUMBIA, South America: two "D 1700"

Caterpillars for a marine installation with an Onan generator. Liss Equipment Co. supplied the engines.

LEADERS in marine activities were invited to the annual meeting of the Marine Industries Association. Plans were discussed for forming chapters on both coasts to further the Marine Industry in Florida. The two-day party was held at the Macfadden Deauville Hotel, Miami Beach. An afternoon session was devoted to planning a Marine Forum to be held at the Annual Miami Motor Boat Show, February 15-20, 1952. Officers elected were Capt. Edwin LeMay, Pres., Thomas Phillips, Vice Pres., and Robert Thompson, Secretary.

PROTECTION DURING HURRICANES: To make the Greater Miami telephone system less vulnerable to hurricanes and power failures, every Central Office of Southern Bell has an emergency power plant. During the hurricane of October 1950, which had gusts of winds up to 148 mph., there were no interruptions of telephone service in Greater Miami. This foresight on the part of Southern Bell contributed greatly to the health and welfare of the citizens of Miami during this emergency. The main office in Miami has an 8 cylinder Superior 240 kw. model V.D.M.B. 8 and a Westinghouse exciter, installed by Auto Marine Engineers of Miami. The branch offices have two G.M. 6—"71"—60 kw. and a 3—"71"—30 kw. Mr. Twyford, plant manager, stated that they have on order, for the new Coral Gables office, two G.M. 6—"71"—60 kw., and expect to replace all gasoline units with diesels as soon as they can be obtained.

Rebuilt diesel castings... with the



Guth FUSION* PROCESS

Save yourself costly shut-downs. Save the expense of new castings. Send broken diesel heads, blocks, and castings to Guth for renewal by the Guth Fusion process backed by 25 years of successful experience. Ask any Guth user or send today for illustrated catalog.

Dealerships available. Write today for complete information.

* A specialized system of reconstructing damaged or worn castings to new or better-than-new condition conforming with latest factory specifications... fully guaranteed.



GUTH COMPANY
McPHERSON, KANSAS

WRITE FOR ADDRESS OF NEAREST DEALER



POWERS ACCRITEM
TEMPERATURE REGULATOR
For Jacket Water and Lube Oil Control

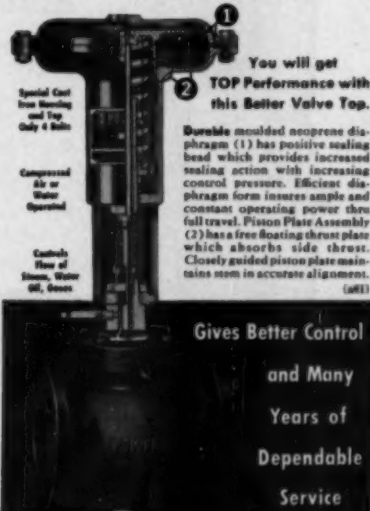
Unsurpassed for reliability and power to operate large or small size 3-way or 2-way diaphragm valves for accurate control of jacket water and lube oil cooling temperatures.

IMPORTANT ADVANTAGES

- Adjustable Sensitivity and over-heat protection.
- Calibrated Dial temperature adjustment.
- Simple, Rugged Construction withstands vibration and insures many years of reliable service.
- Temperature Ranges 50 to 250° F. and 150 to 350° F.
- Easy to Install Requires 15 lb. supply of compressed air or water for its operation.
- Small Size—regulator head is only 2 1/8" x 3 1/4", sensitive bulb is 12" long with 1/4" I.P.S. connection.

Write for Bulletin 216

Powers FLOWRITE Valve controlled by a Powers ACCRITEM Regulator makes an unbeatable combination for better control and — Less Maintenance



You will get TOP Performance with this Better Valve Top.

Durable moulded neoprene diaphragm (1) has positive sealing bead which provides increased sealing action with increasing control pressure. Efficient diaphragm form insures ample and constant operating power thru full travel. Piston Plate Assembly (2) has a free floating thrust plate which absorbs side thrust. Closely guided piston plate maintains stem in accurate alignment. (all)

Gives Better Control and Many Years of Dependable Service

THE POWERS REGULATOR CO.

2411 Oakton Street, SKOKIE, ILL. • Office in over 80 Cities
60 YEARS OF WATER TEMPERATURE CONTROL

Million Milers

A trucking company in the southwest that has used diesel trucks since 1939 reports that each of its original eight models traveled approximately one million miles in the second of a series of case histories on trucks published by GMC Truck and Coach Division. Chief Freight Lines became a pioneer user of diesels in 1939 when it bought eight GMC Model ADF 501 units. With fuel costs then being 4½ cents per gallon, and the new GMC's averages 7½ miles per gallon, the savings realized "more than paid for the cost of the equipment in very short order," according to the case history. The GMC brochure which is being distributed by dealers and is available on request, also revealed

that Chief Freight Lines had in 1948-50 road-tested 10 of 16 experimental units which were the forerunners of today's GMC middleweight diesel models.

Nozzle and Testing Equipment



Bacharach Industrial Instrument Company has expanded its line of nozzle and injector testing equipment to include several sets suitable for testing injection units of medium and large bore and stroke diesel engines. The combination set illustrated is one of the new nozzle and

injector testing devices for heavy duty diesels. It comprises specially developed and simplified fixtures, the Bacharach nozzle test pump, and suitable fuel line connectors. The nozzles and injectors which can be tested with this combination set include: Electro-Motive 567 and 201A injectors, GM 278 and 278A injectors, American Bosch T, U and V size nozzles and Types AKA, AKB and AKK nozzle holders, Bendix-Scintilla C and D size nozzles, and Types HCA, HCL, HCU, HCV, HDA, HDV and HDW nozzle holders, Fairbanks-Morse nozzles, and Ex-Cell-O nozzles for F-M engines. Adeco and Demco nozzles may also be tested with this set. Complete particulars are available from the manufacturer, Bacharach Industrial Instrument Company, 7000 Bennett Street, Pittsburgh 8, Pa.

Zero-Lash HYDRAULIC VALVE LIFTERS

—automatically maintain
zero clearance in the
valve train at all times



Zero-Lash opens the door to:

- Cam design improvement for optimum engine operating efficiency.
- Freedom from loss of efficiency from varnish and sludge.
- Perfect tappet adjustment for the life of the engine under all engine operating speeds and temperatures.
- Longer and better service for valves and seats.
- Silent valve train operation.
- Smoother idling.

Eaton engineers welcome the opportunity to discuss application of its multiplicity of hydraulic valve lifter designs to engines proposed or now in design.



EATON MANUFACTURING COMPANY

CLEVELAND, OHIO

SAGINAW DIVISION: 9771 FRENCH ROAD • DETROIT 13, MICHIGAN

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings • Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamic Drives, Brakes, Dynamometers

Muffled Music

The sound of a 225 horsepower tractor engine may be music to the ears of a contractor, but sometimes he has to turn the music down. The Caterpillar Tractor Company is now offering a complete muffler group for the new diesel DW20 and DW21 tractors similar to that offered for the smaller DW10. The new attachment will reduce engine exhaust noise, providing greater operator comfort and reducing annoyance for people living near job sites.

New Priming System Tool



A new model puncturing tool, for use with the priming system for Chevron starting fluid capsules, has been produced by the California Oil Company. Upper and lower chambers of the tool are protected by overlapping metal skirts. The tool is an aluminum die casting and cannot crack or break. Another feature is a plug and screen trap at the end of the lower chamber which may be removed for easy cleaning. The plug is attached also to the tool and its mounting by a chain so it will not be lost if shaken loose by jars or vibrations. The new tools are available to users of Chevron starting fluid capsules, a cold weather starting aid for both diesel and gasoline powered equipment. Headquarters of the California Oil Company are at Barber, New Jersey.

Union Diesel Marine Installation

Last month, Nelson Brothers Fisheries of New Westminster, British Columbia, Canada, ran trial runs on the Union diesel re-powered YMS now known as *Western Challenger* with a party of more than forty guests. Extremely satisfactory performance was noted. The vessel obtained 11½ knots from the 560 horsepower at 325 rpm., model V6 Union diesel. Mr. Ritchie Nelson, president of Nelson Brothers Fisheries, reported "complete satisfaction in every detail."

DIESEL ENGINE CATALOG is now available in its sixteenth expanded edition. Completely revised and re-edited, it is an invaluable aid to design engineers and buyers. Fully illustrated. \$10.00. Order now from **DIESEL PROGRESS**, P.O. Box 8458, Cole Station, Los Angeles 46, California.

A Shot For Diesel Fuel

"Diesel fuel ignition quality, supplied by the addition of amyl nitrate, compares favorably with that inherent in a clear fuel of the same cetane number for a wide range of diesel engine operating conditions." This statement was included in a paper presented by Merrill J. Anderson and Grover C. Wilson of the Ethyl Corporation before the National Fuels and Lubricants Meeting of the Society of Automotive Engineers. The authors reported that over-all cetane-number requirement for the full scale engine tested is greater for low-load, low-speed operation than for high-speed, high-load operation. Amyl nitrate provided ignition quality which was effective in both ranges of engine operation, the authors pointed out.

It is common knowledge that the ignition quality ratings of diesel fuels can be increased by the addition of amyl nitrate. The Ethyl Corporation paper clearly shows, moreover, that beneficial effects for the operation of full-scale engines can be realized from this improvement in rating. The benefits so achieved assume considerable importance when it is remembered that all signs point to a steady increase in demand for diesel fuels, accompanied by growing demands for use of straightrun stocks of the same boiling range for catalytic-cracking charge stocks, burner fuels, and jet fuels. For these reasons, distillates from cracking processes will become an increasingly important source of supply for diesel fuels. While cracked distillates have the advantage of lower pour point and a higher heating value per gallon, in general they are lacking in diesel fuel ignition quality. If they are to be used, then this quality must be supplied. One of the most desirable means is through the addition of a small amount of an ignition accelerator. To be of commercial importance, however, an ignition accelerator must not damage full-scale diesel engines or increase maintenance problems in any way. Also, it must have a low cost for a given gain in cetane number—meaning that such an agent should be effective when used in small quantities.

"Of the nearly 300 compounds investigated so far by the Ethyl Corporation, amyl nitrate was found to possess the most attractive overall properties," the authors stated. "For example, one-eighth to one-quarter volume per cent is sufficient for cetane-number gains of four to seven units. The addition of small quantities of amyl nitrate to distillate stocks should materially increase supplies of diesel fuels by permitting the use of greater quantities of cracked distillate. Better uniformity of fuels can also be obtained and blending can be done with a consideration for other important qualities," they concluded.



DECEMBER 1951

IS WASTE HEAT WASTING YOUR MONEY?



MAXIM

**HEAT RECOVERY SILENCERS
CONVERT WASTE EXHAUST HEAT
TO USABLE STEAM or HOT WATER**

A big Los Angeles Sewage Disposal Plant found that Maxim Heat Recovery Silencers provided all the steam necessary for plant heating as well as heating the sludge—and from exhaust heat that would otherwise have been wasted.

Perhaps your own operating expense picture can be improved by this simple and effective way to provide extra steam or hot water for heating or processing operations while at the same time effectively silencing exhaust noise. Our engineering department will be glad to make recommendations.

Automatic Controls

In figure E water is low and there is less effective heating surface (floating surface in contact with water), hence lower steaming rate.

In figure F water is high and gives greater effective heating surface—higher steaming rate. Steam pressure regulated valves control the amount of water to produce desired steam capacity.

FIG. E

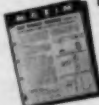
FIG. F



Consult

MAXIM

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DEPT. W1 Gentlemen: Please send me your Bulletin on Heat Recovery Silencers



MAXIM

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COMPANY _____

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for 44 Years**

Gaskets of all types and materials to give reliable service under all Diesel operating conditions.

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SINCE 1898 **GASKETS**
THE COMPLETE LINE THAT COMPLETELY SATISFIES

Attention: Maintenance Superintendents and Owners
of Diesel-Powered Equipment



**HANCOCK
RECONDITIONED
UNIT INJECTORS
FOR GM 71 AND
567 ENGINES ARE
AVAILABLE FROM
OUR STOCK ON
AN EXCHANGE
BASIS, AS ARE
GM 71 FUEL
TRANSFER PUMPS**

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- One day delivery from our stock.
- The service of a modern injector laboratory completely tooled with the latest grinding, lapping and gaging equipment to handle all necessary work.
- A flat price for injector exchange regardless of condition of the plunger and bushing.
- A completely rebuilt unit injector that has been thoroughly tested after an actual run-in test.
- Any output of 71 engine injector available—60 mm, 70 mm, 80 mm and 90 mm.
- An unconditional guarantee of satisfaction.

We will buy used General Motors and Caterpillar injection equipment.

Dealers write for our attractive proposition

DIESEL SERVICE DIVISION

HANCOCK MACHINE COMPANY, Inc.
300 WALNUT STREET FINDLAY, OHIO

Inland River Reports

By DAVID I. DAY

THE SUBMERSIBLE oil drilling barge C. W. Yancey, recently completed at Avondale Marine Ways near New Orleans, is busy at work for the Rowan Drilling Co., Ft. Worth, Tex. The Yancey is dieselized using a set of five Cooper-Bessemer to drive the generators.

THE NEW *Inca*, 98 x 30 x 10.3 feet, is powered by twin National Supply diesel engines totaling 1800 hp. The boat was built at Sturgeon Bay shipyards in Wisconsin for the Indian River Lines. She started at work on the Illinois but more recently is pushing gasoline and oil on the upper Ohio under command of Capt. Don Hammett. She is a very fast boat running with heavy loads 8 miles an hour in pool water. The auxiliary engines are Buda and General Motors.

THE FINE old *Mokita*, built 16 years ago by the Erlbacher Bros., Cape Girardeau, Mo., and later operated by Streett Towing Co., St. Louis, is now the property of the Iron City Sand & Gravel Co., Pittsburgh. The boat has two smooth-running National Superior engines, generating 1180 hp.

AT WORK this month between Marrero, La., and Petco Corporation terminals at St. Louis and St. Paul is the sweet new oil towboat called *Petco 20*. The boat was built at Sturgeon Bay, Wis., is 98 feet long, with 30-ft. beam, and is powered with General Motors (Cleveland) twins generating 1800 hp. From all lower Louisiana ports we have had reports of the speed and easy handling of the *Petco 20*.

THE *MARILYN M* of the B & M Towing Co., Houston, was a fast-moving tug near Wheeling when your correspondent saw her recently pushing two barges of oil, headed for Pittsburgh or vicinity. This tug is 78 x 28 x 8 and is powered with a 930-hp. Cooper-Bessemer diesel engine. We photographed the boat some four years ago when she was under construction at Houston, Texas.

RIVERMEN ALONG the lower Ohio and the Mississippi in late October got their first look at the new *W. S. Rhea* as she passed downstream. She is 176 x 40 x 11 feet and powered by reconditioned diesel engines from a war-surplus medium landing

ship and has much the appearance of the *L. Wade Childress* of the same Mississippi Valley Barge Line fleet. The new boat was built by Dravo and has Dravo Kort Nozzles.

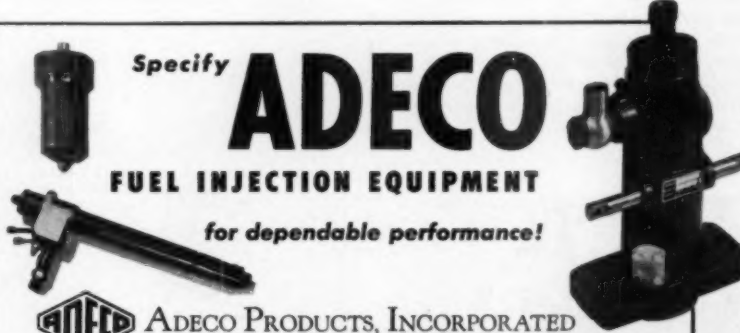
THE OLD steamer *R. J. Nugent* is out of the picture. She has been sold "down South" to be used as a quarter boat by an oil drilling outfit, being towed down the river from St. Louis by the diesel vessel *Sam Houston* of the famed C. P. & T. fleet of Houston. The *Sam Houston*, as can be said of the whole fleet is powered by Enterprise diesels, 1500 hp. As the old *Nugent* passed down from view below St. Louis, it was the thought of all observers that the passing was symbolical of what is taking place wherever efficient and economical power is sought on our rivers.

ONE OF the interesting small towboats to come forth before cold weather is the *Billy Potts, Jr.*, being built by her owner, Capt. W. F. Potts at Sardis, Ohio. The hull is 60 x 16 and will have two General Motor diesel engines, totaling 330 hp. The plan is to use the boat in towing much of the time but in times of high water or ice will be employed pushing the ferry flat at Sardis.

THE LITTLE sternwheeler *Keystone* of the Ohio River Sand & Gravel Company will be out shortly equipped with a new 200 hp Buda engine. This boat was built by the Zubik interests in Pittsburgh in 1937. Capt. George Birge has commanded for years.

THE M.V. *Alice* of the Crounse Corporation, Paducah, Ky., and built at Paducah Marine Ways, has made a fine name for herself in the small-boat class on the inland waterways. Last year she pushed 63,000 net ton miles of cargo up from Texas oil fields, total traveling 35,000 miles and in motion 80 percent of the time. She continues her fine record. The boat is powered by a Caterpillar diesel engine, 500 hp.

WE WERE astonished to see our old favorite, the *Dravo 42* running on the upper Ohio with a new name. She is now registered as the *Beaver* and belongs to the Union Barge Line, Pittsburgh. Since 1937 she has been constantly at work. Her Nelsco engine is good for around 350 hp. Capt. Russell Fry is the present master.



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MASTER CRAFTSMEN OF FINE FUEL INJECTION EQUIPMENT

Caterpillar Officers



Harry H. Fair



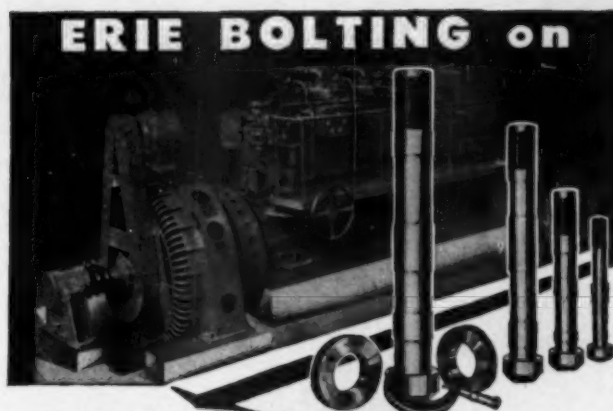
A. H. Brawner

Harry H. Fair of San Francisco was elected chairman of the board of directors of Caterpillar Tractor Company at a recent meeting of the board in San Francisco. He succeeds C. L. Best, who died in San Francisco September 22nd. Elected to the board to replace Mr. Best was A. H. Brawner, president of W. P. Fuller & Company, San Francisco, oldest and largest Pacific coast glass and wall-paper firm. Mr. Fair's connection with the tractor business dates back to 1918 when he became a stockholder and director of Best Tractor Company, one of the constituents of Caterpillar Tractor. He was prime mover in the formation of Caterpillar and has continuously been on its board and executive committee. Mr. Brawner is a grandson of the original W. P. Fuller, founder of the Fuller firm. He is well known for his World War II service with the army. Stationed in Chicago, Col. Brawner headed the labor branch of the Sixth Service Command until his return to civilian life in November 1945. For this service, he was awarded the Legion of Merit.

EMD Personnel Shifts

A program of expansion of sales, service and parts personnel of Electro-Motive Division of General Motors to meet customer needs growing out of the rapid increase in the use of diesel locomotives during the past several months has been completed according to an announcement made by Mr. N. C. Dezen Dorf, director of sales and service. The personnel moves have included: Promotion of Mr. C. L. Moss, formerly sales representative, Washington, D. C. to district sales manager, New York; promotion of Mr. James B. Swindell, from sales representative, Chicago, to district sales manager, Chicago; promotion of Warren A. Thomas, formerly manager of statistics and market analysis section in the sales department, to sales manager, LaGrange factory branch; Charles F. Lincoln, Jr., formerly manager of product application section of the sales department, has been promoted to assistant general parts manager; Mr. Lincoln has been succeeded as manager of the product application section by Kenneth J. Wolf, who has been in that section since October, 1945. Four others have been promoted to the position of sales representative, two in the Chicago office and one each in Washington and New York. Floyd E. von Ohlen and Norbert A. Minor are now in the Chicago office. Donald S. Fricke and Harold P. Gustafson are now in Washington and New York respectively. John F. Greenip is now parts representative for the St. Louis region. John L. Rose has succeeded Warren A. Thomas as manager, statistics and market analysis section.

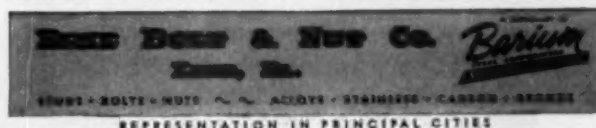
DECEMBER 1951



DIESEL ENGINES

For over 30 years ERIE has manufactured bolts and studs to the specifications of Diesel Engine builders. This specialized experience gained in working with leading Diesel designing engineers assures you of getting the

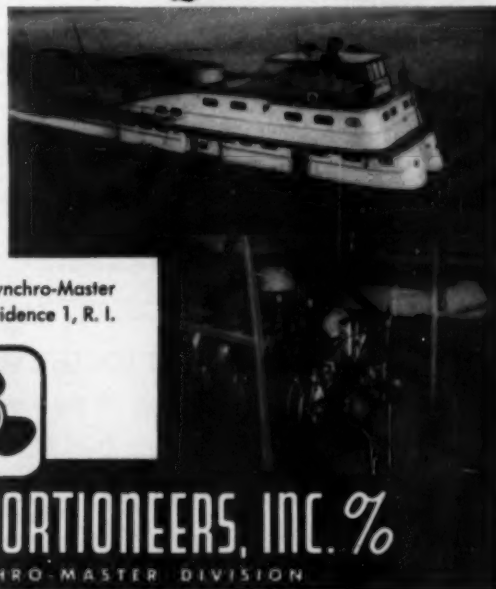
exact materials and the precise tolerance in bolting desired for your Diesel. Send us your specifications for Diesel Connecting Rod Bolts, Cylinder Head Studs, and other special bolting. Write for new price and data book.



Get rid of the SHUDDERS

Shudders characteristic of twin and multiple screw boats can be greatly reduced by Synchro-Master which automatically controls the relative speeds (revs.) of all engines. Give us a chance to prove this, by writing for data and recommendations.

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Heads Manufacturers' Association



William A. DeRidder

William A. DeRidder was elected president of the California Manufacturers' Association at a meeting of the board of directors which was held recently. Mr. DeRidder is chairman of the board of General Metals Corporation. His wide experience and familiarity with the problems of West Coast manufacturers assure the association of outstanding leadership during the coming twelve months. The career of Mr. DeRidder reads like

a Horatio Alger story and proves again that America is the land of opportunity. Born in Amsterdam, Holland, he came to this country in 1915 as an immigrant boy. He subsequently served in the Merchant Marine, and shortly afterwards, joined the organization of Western Drop Forge Company, one of the original concerns included in what is now General Metals Corporation.

Graham-Paige Acquires Sterling Interest

The entire holdings of Baldwin-Lima-Hamilton Corporation, 40,040 shares of prior preferred stock, in the Sterling Engine Company, has been acquired by Graham-Paige Corporation. This represents the largest single holding of stock ownership in Ster-

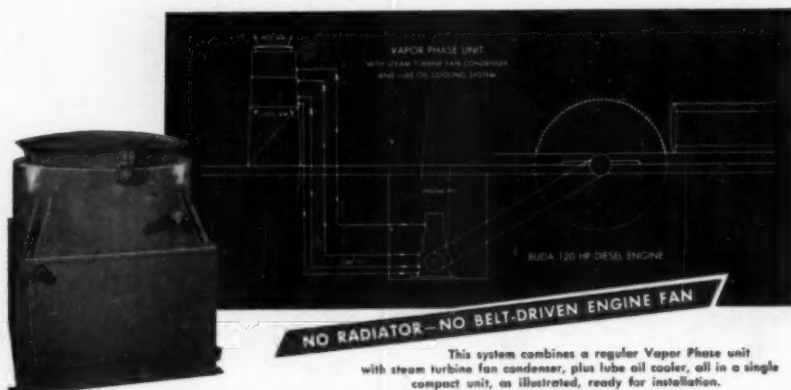
ling. Joseph P. Frazer, chairman of Graham-Paige, has been elected chairman of the board at Sterling. John J. Bergen, chairman of the executive committee of Graham-Paige was elected to a similar post in the acquired company. Irving Mitchell Felt who negotiated the transaction is chairman of the Graham-Paige financial committee, was a director of Sterling and is now the chairman of its finance committee.

Sterling has two plants in Buffalo where it manufactures diesels ranging from twenty-five to 1,000 horsepower and gasoline engines from 100 to 600 horsepower. Founded in 1901, Sterling is among the oldest independent engine manufacturers in the country. Its engines are used by railroads, the oil industry, the marine field and the armed forces.

VAPOR PHASE works for the Lumber Industry, too!

PULLS POWER out of a hole IN VENEZUELA

SO LOGS FROM THE WOODS MAY BE SAWED *profitably!*



This system combines a regular Vapor Phase unit with steam turbine fan condenser, plus lube oil cooler, all in a single compact unit, as illustrated, ready for installation.

Early in 1950, the *Aserradero Kalmanson y Levy Saw Mill at San Felipe, Venezuela*, faced a serious power problem.

Plant design had put the engine that powers the huge log saw, down in a hole or pit under the saw floor. Convenient location to the saw, yes, but *murder* for any engine cooled with belt-driven fan and radiator.

Without adequate cooling, that engine pit would become a virtual *hellhole* of boiling radiators, power failure, high costs!

SO, IN MAY 1950, Vapor Phase engineers got on the job. The engine, a Buda 6DC-844 120 HP Diesel, *minus* the inefficient radiator and fan, was placed in the pit.

Up on the saw mill floor, where the air was fresh, they installed this amazing Vapor Phase system and hooked it up with the engine. *That did it!*

NOW, the engine, relieved of fan drag, delivers 10 to 12 percent *more power*. During operation, engine temperature remains at constant, uniform peak efficiency, regardless of load or conditions.

With Vapor Phase, *waste heat* (not engine power) controls the cooling, keeps it uniform. Destructive engine condensation, corrosion, sludging, etc., are eliminated. Break-downs and repairs are rare!

Vapor Phase functions automatically—

AND ALL IT COSTS IS FUEL FOR THE ENGINE!

Sizes available for any individual or group of Diesel, Gasoline or Gas engines.

★
VAPOR PHASE equipped engines also serve to generate steam, heat fluids, space or other process, and cool via air conditioning—each as required or all at the same time.

VAPOR PHASE pays off in Savings alone, the first year. The unit costs nothing to operate and is good for life.



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Mack Appointments



E. M. Young



John Steinhauer

Appointment of E. M. Young as manager of Mack Motor Truck Corporation's Charlotte (N.C.) District has been announced by E. G. Ewell, vice president and eastern sales manager. Mr. Young, who since 1944 has been assistant to the manager of the truck company's southern division, Atlanta, joined Mack in 1924 as an assistant cashier at Knoxville, and in the ensuing years served the company in its Miami, Nashville and Charlotte offices before making his headquarters at Atlanta. Replacing Mr. Young as assistant to the southern division is John Steinhauer who, since 1949, has been a salesman in the company's Atlanta territory.

Appointed to Executive Staff

Captain Ellsworth E. Roth, U.S.N., Ret., has been appointed to the executive staff of the Kalamazoo works of the Ingersoll Products Division of Borg-Warner Corporation. He has been named assistant to the works manager, defense division. Captain Roth's appointment was disclosed by R. A. Anderson, vice president of the Ingersoll Products Division and Kalamazoo works manager. Mr. Anderson pointed out that Captain Roth's experience as chief of the naval continuing board for development of the LVT will be of particular value to the Ingersoll Products Division, which is currently designing and building an amphibian vehicle for military use.



DIESEL PROGRESS

Portable Sawmill

A father's sawmilling experience and a son's mechanical training received in the Army are responsible for a unique sawmill now being operated in northern Wisconsin. Art Halbesleben of Aniwa, Wisconsin has operated sawmills for over thirty years. His son, Howard, serviced Army equipment during World War II. When Howard's hitch was up and he returned home, father and son devised a rig that goes into the woods under its own power and cuts up a million and a half board feet of lumber a year.



Howard and Art Halbesleben and the GM diesel that powers their portable sawmill.

The mill consists of a truck-mounted power unit and a separate carriage and track which is mounted on an axle when traveling. It is 44½-ft. long and 7-ft. 10-inches wide when ready for the road. This is compact enough to drive over Wisconsin highways without special permit. Since Howard worked on diesel engines while in the service, it was natural for him to build the rig around such an engine. He selected a 4-cylinder GM diesel, which since 1947, has been driving the 54-inch saw, the two blowers and has also been propelling the rig over highways and rough terrain.



The Halbeslebens' portable sawmill cuts into a sizable pile of logs for a customer.

The engine is belt-connected to the transmission when traveling and moves the rig along at 30 miles per hour. According to the Halbeslebens the mill can be set up in any location ready to saw in 50 minutes. When a farmer in the vicinity wants to build a barn or a house, he cuts his timber, calls in the Halbeslebens and a few odd hands 'round about and his lumber is cut to size in short order.

DIESEL ENGINE CATALOG is now available in its Sixteenth expanded edition. Completely revised and re-edited, it is an invaluable aid to design engineers and buyers. Fully illustrated. \$10.00. Order now from **DIESEL PROGRESS**, P.O. Box 8458, Cole Station, Los Angeles 46, California.

DECEMBER 1951

LEADING ENGINES HAVE

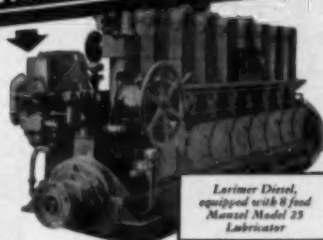
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• With Manzel Lubricators you know every wearing point is always receiving exactly the amount of oil it needs. Manzels don't forget or make mistakes. As a result machinery operates efficiently for many more years.

Standard equipment on leading makes of presses, engines, and other machinery, they can also be installed on your present equipment.

We will gladly have a Manzel lubrication engineer submit recommendations without obligation. Just write...



Larimer Diesel, equipped with 8 feed Manzel Model 25 Lubricator

Why it Pays to Select Manzel Lubricators

- THEY CORRECTLY LUBRICATE EACH POINT
- THEY ARE AUTOMATIC AND TROUBLE-FREE
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REDUCE YOUR ATOMIZER REPAIR BILL BY 95%

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Machines will do this work to manufacturers' original standards and reduce your atomizer repair bills by 95%. The Merlin Service Master will grind a point dead concentric with another portion and retain a predetermined angle to within a minute of a degree. It is the first and only machine for these operations. Designed for use in your own shop! Full details from Dept. DP.

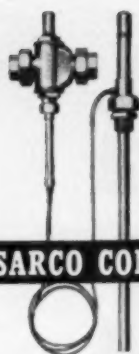


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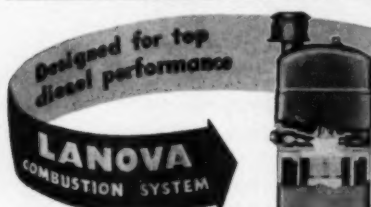
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Automatically controls jacket water and lubricating oil at proper temperature on Diesels.

Available direct acting as by-pass control, reverse acting to throttle the water flow, and in diversion Typos. Bulletin 706.

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- High combustion efficiency
- Smooth, quiet operation
- Top-notch operating economy
- Clean exhaust
- Easy starting



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WANTED—Experienced man to head up Diesel Marine Engine Division for a large mid-western Diesel manufacturer. Personnel of the advertiser familiar with this ad. Address: Box 500, DIESEL PROGRESS, 816 N. LaCienega Blvd., Los Angeles 46.

ON-THE-JOB TRAINING

On-the-job training in the operation and maintenance of diesel engines offered by the Detroit Diesel Engine Division of General Motors has now been made available to diesel owners and operators in practically all parts of the North American continent. The newest addition to the fleet of mobile training schools originally sponsored by the Division has been dispatched to its first assignment near Alberta, Canada. Another unit recently installed in Mexico is ready to start training diesel men south of the border. These new additions bring the total number of mobile diesel training schools operated by General Motors to a total of nine units.



GM Mobile Training Unit being unloaded for two-day session at headquarters of Morrison-Knudsen Company, Inc. at Boise, Idaho. The facilities are unloaded and set up ready for school in less than 60 minutes.

T. L. Guarniere, Service Training Director of Detroit Diesel, said owners and mechanics in the United States have been quick to realize the advantages of this practical diesel training and over 10,000 men in the construction, lumbering, mining, fishing and petroleum fields have already attended the schools. Similar training in the trucking industry is provided by General Motors Truck Division. The schools have been held in the field on projects when dieselized equipment is being operated and also in the establishments of GM diesel and GMC truck distributors and dealers throughout the country. The new Canadian unit, co-sponsored by the Diesel Division of General Motors Products of Canada, Ltd., has a schedule that will take it from coast to coast in the next 13 months.

According to Mr. Guarniere, the training course

is open to diesel engine owners and operators upon application to Detroit Diesel's distributors and dealers and GMC truck dealers. The course offers practical knowledge and proper servicing techniques on GM diesels and is designed to help owners and operators get maximum efficiency out of their units. It also keeps them up to date on the latest in approved GM maintenance and operating procedures.



The training school in session on the premises of an Illinois oil-well driller. Classes are kept small enough to permit individual instruction and full participation in engine tune-up and diagnosis.

The units are transported by dieselized trucks and consists of over four tons of training aids including engines, cutaways, sub-assemblies, movies, slide films and charts. The Mexican unit is co-sponsored by General Motors Overseas Operations and is manned by factory trained native instructors.

Third Diesel Tug for Esso

The third diesel-electric tug to be added to Esso Standard Oil Company's harbor fleet in the past year, Esso Tug No. 11, was recently commissioned at Pier 90, North River, New York City. R. G. Kimball, general manager of the Inland Waterways Department, raised the house flag on the vessel. Like her sister vessels, Esso Tug No. 11 is equipped with a 1000 horsepower General Motors diesel-electric engine. The 103-foot craft has a speed in excess of 13 knots and is 192 gross tons. The craft was designed by Tams, Inc. of New York and built by the Gulfport Shipbuilding and Dry Dock Company of Port Arthur, Texas. It will be under the command of Captain J. Crawford of Bridgeport, Connecticut.

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KURZ & ROOT Company

APPLETON - WISCONSIN

West Coast Diesel News

By FRED M. BURT

THE OLD tuna clipper, *Zarco*, formerly *Chicken of the Sea*, has been repowered with a new 525-hp. Enterprise diesel engine installed by Campbell Machine Co., San Diego; managing owner, Manuel Faiteira.

ALBACORE BOAT, *Coronet*: (Skipper, Jess Kerton, owners Roy Wilson and Al Woodruff, of San Diego) has had a new Petters 2-cyl. 10-hp. diesel, to operate auxiliaries, supplied and installed by Shepherd Diesel Marine.

COMBINATION FISHER of Newport Beach, *Shani Girl*, owned by Julius Vasko, Costa Mesa, was recently repowered with a 6-cyl. Graymarine diesel.

CUMMINS DIESEL SALES of British Columbia, Ltd., Vancouver, B.C. have moved to new quarters at 1490 East Georgia Street where the floor space will eventually total 16,800 sq. ft. The Company is headed by Fred Clark who became distributor of Cummins diesel engines in British Columbia in 1940; he has done all right as there are more than 3000 of these Cummins diesels in operation in B.C. today.

THE NEW marine engine manager of Emil Riutta's Engine Sales and Service on Terminal Island is A. M. ("Gus") Walker; providing sales and service on Murphy P. & H., and Witte diesel engines. Walker was formerly associated with Atlas Imperial Diesel Engine Company in Astoria, 1939-1945; more recently with Oswald Machine Works, San Francisco.

THE UNION Diesel Engine Company factory representative in the Pacific Northwest is now John De Polo, Jr. who has many years of experience with Union diesels both as operator and factory service man. He is located at 2124 North 29th Street, Tacoma, Washington.

FOR MICHEL Izzy Construction Co. an International TD-9, 41-hp. diesel on Hough Loader from Smith-Booth-Usher, Los Angeles, for use on big Costa Mesa city sewage project.

SEVERAL DOZEN Hallett diesel engines recently shipped to the Philippines are for use in fishing operations as follows: 1-cyl. 8-hp. and 2-cyl. 18-hp. water-cooled engines for fishing boat propulsion units, and 1-cyl. 3-hp. air-cooled diesels for auxiliary use.

SUPPLIED BY Watson & Meehan, San Francisco, Northern Calif. Cummins dealers, two 300-hp. Cummins diesels to power a pleasure yacht owned by a prominent San Francisco Ford dealer.

FROM SHEPHERD TRACTOR & EQUIP. CO., Los Angeles, a 150-hp. Caterpillar diesel purchased by United Concrete Pipe Co. to repower a drag-line; a 5-kw. Petter diesel generating set for Luis Gayou's shrimp trawler working out of San Felipe, Mexico; an 80-hp. Caterpillar diesel having been shipped earlier to power his freezer ship.

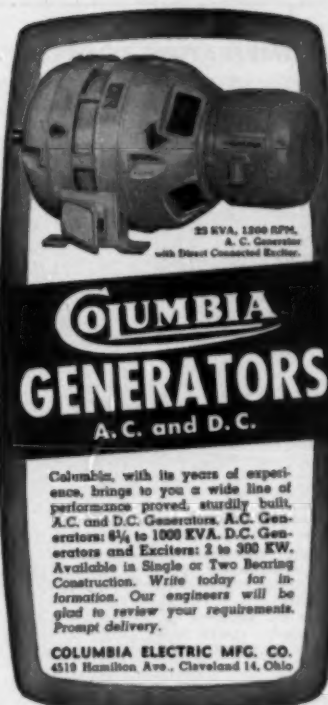
FOR THE THIRD one of Tidewater-Associated's Ventura oil field Kobe oil pumping units similarly equipped, a single, large Vapor Phase unit and heat exchanger, from Engineering Controls, Inc., Los Angeles, to provide a single cooling system for ten new 50-hp. Minneapolis-Moline natural gas engines, and to heat the oil used in pumping.

A LARGE shipment of Hallett 8 and 18-hp. water-cooled diesel engines has gone to Belem, Brazil, for use in powering small freight boats that operate on the Amazon River.

OVERSEAS SHIPMENTS by Medcaris Oil Well Supply Co., Torrance, Calif. for Arabian-American Oil Co., six Caterpillar diesel generating sets, two each 20-kw., 30-kw., and 45-kw., also two 30-kw. General Motors units; units used for standby power and for lighting.

FROM Oswald Machine Works, a model M.E.-6, 135-hp. Murphy diesel for Arthur Siri, Santa Rosa, to repower the N.W.-8 drag-line used in logging for the Masonite Corporation, Ukiah, Calif.

FOR 43½-FT. fishing boat, *My Pride*, owner Lynden E. Merritt, San Francisco, a 63½-hp. 6-cyl. Lister diesel engine with 3:1 Lister reduction gear from Hall-Young Company, San Francisco; also for auxiliary 8-hp. air-cooled Armstrong-Siddeley diesel engine.



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Write for Tuthill Model L Bulletin

TUTHILL PUMP COMPANY

939 East 95th Street, Chicago 19, Illinois

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A large, dark, circular industrial component, possibly a motor or generator, is the central focus. It has a thick, circular frame with a serrated or toothed inner edge. In the center of the frame, a smaller, more complex mechanical part is visible, featuring a cylindrical body with a flange and a smaller cylindrical protrusion on the right. The background is white. The text "These torque" is written in a large, bold, black, sans-serif font across the top of the image. In the bottom right corner, there is a circular logo with the word "Elliott" in a script font above the words "FABRI-STEEL" in a bold, sans-serif font, with "MOTORS AND GENERATORS" in a smaller font below.



run in size range from 60 kw 600 rpm, to 7000 kw 164 rpm. All in the famous Elliott "Fabri-Steel" construction which assures extreme crack-proof strength and rigidity, with easy adaptability to specific operating requirements.

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4929



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You'll agree that cases like this offer pretty good evidence that it pays to replace outmoded or inefficient propulsion

power. And, Captain Clyson Coffin, skipper and owner of the "St. George", shares the conviction with many a man in the fishing industry that the *best* way to do it is with Cooper-Bessemer power.

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